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COOPERATION BETWEEN PHARMACOLOGY AND THERAPEUTICS *

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It is important that a healthy cooperation should exist between those who are engaged in the scientific study of drug action and those who use drugs for the purpose of curing or alleviating disease; for the problems of pharmacology, like those of pathology, have a very immediate bearing on medical practice. Established modes of treatment frequently form the starting point of scientific studies, and the exact knowledge thus gained leads in turn to greater precision in treatment. Pharmacologic studies have uncovered new therapeutic possibilities that have ultimately proved useful in the clinic. Finally, a clear recognition of the fact that substances of similar chemical structure frequently possess pharmacologic properties that are similar but not identical has opened up a vast field of research. Numerous compounds of a given type are now produced with comparative ease by the organic chemist. While many or most of these may possess no great practical advantage over their original prototypes, yet such studies are constantly leading to improvements in our remedies, and the possibility is always present that the systematic combination of chemical and pharmacologic research will tap important fields that have hardly been suspected hitherto.

Now more than ever before, therapeutic advance depends on an intelligent utilization of the methods, the criticisms and the new discoveries of pharmacology. Older remedies are being restudied, and from the host of newer ones that are constantly being placed before the profession an intelligent choice must be made. Before I undertake to discuss how cooperation between the pharmacologist and therapeutist may be promoted, however, it may be well to point out some of the factors which tend to separate these two classes of workers. In the first place, their attitudes toward their respective problems are essentially different. The pharmacologist contemplates with scientific skepticism that which is unproved, and he proceeds slowly and carefully from the known to the unknown. The therapeutist, on the other hand, brought face to face with a crisis in the life of his patient, cannot refuse to try the unproved when remedies of known efficacy are lacking. Hence he often grasps at straws, being restrained only by the possibility of doing harm to his patient. Such a practice, justifiable in itself, too often leads to those habits of inaccurate reasoning that are reflected in therapeutic literature. Optimism in practice often means an unjustified and uncritical enthusiasm in the interpretation of results.

The pharmacologist and the therapeutist are further separated by the conditions under which their observations are commonly made. In the laboratory the action of drugs is usually studied on normal animals, and toxic doses can be administered with impunity. In the clinic, on the other hand, therapeutic doses alone are used, and the effects of these are often modified by disease. The pharmacologist is permitted to employ methods of study which involve operative or other harmful procedures. The clinician is restricted to those methods of study that can be used without harm to his patient. Finally, the laboratory worker plans a series of experiments, and he endeavors to eliminate errors by repetition and by controlling the various factors that might influence his results. In therapeutics the number of observations is necessarily limited by the available clinical material, and the interpretation of results is often hampered by the fact that the effect of other factors, such as the natural course of the disease and the action of the other drugs used, is difficult to estimate and is, indeed, often estimated incorrectly. Under such conditions, years may elapse before even a simple therapeutic problem is conclusively answered.

As I have said, pharmacologic studies are usually made on normal animals. In seeking to utilize the knowledge thus obtained for therapeutic purposes, the following questions arise: 1. Are the effects observed produced by doses that can safely and easily be administered to patients? 2. Will the human organism react in the same manner as the animal studied? 3. How is this reaction modified by disease?

The question of dosage, simple as it may seem, has caused and will probably continue to cause occasional therapeutic stumbles. The fact that large doses of strychnin were known to produce a marked rise of arterial pressure in animal experiments was in part responsible for its extensive use by clinicians in conditions of low pressure. Yet it now seems established that in safe doses strychnin does not raise the blood pressure materially, either in man or in animals. The rise of pressure, therefore, is a toxic effect; and, so far as we know, it is not available for therapeutic purposes. Due consideration must also be given to the fact that in the laboratory intravenous injections are frequently used, whereas in medical practice these are seldom given except in emergencies. Finally, different species of animals may vary in their reactions to a given drug. When the reaction is essentially the same in a variety of mammals, it may be assumed that the human organism will respond in a similar manner;

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but when the reaction varies, the effect on man cannot safely be predicted from laboratory studies. In practice, moreover, even lesser quantitative variations in response may become of paramount importance, for it is our purpose to secure therapeutic results, and at the same time to avoid unpleasant side effects.

One of the most important methods for helping to bridge over the gap between animal pharmacology and practical therapeutics is the accurate study of the effects produced when drugs are given in the usual medicinal doses to human beings. The methods employed in making such studies must naturally be free from the possibility of doing harm. Fortunately a great variety of new methods have been developed in recent years which may be applied to the study of human functions. Without attempting to name all of these, I mention the following: bloodless determinations of the arterial and venous pressures; graphic records of the gastric contractions, of the arterial and venous pulse waves and of the electric changes accompanying cardiac activity; roentgenographic examinations of the alimentary tract; determinations of the rate of metabolism; chemical analyses of the alveolar air, of small quantities of blood and of excreta, and estimations of the various immune bodies in the blood. Each new method that can be applied to the study of human functions not only advances our knowledge of these functions and of their perversions in disease, but also makes possible more accurate studies on how these functions are influenced by various remedial measures. In many cases such studies can be carried out on normal individuals, and within a short space of time sufficient data can be accumulated to establish with scientific accuracy certain aspects of drug action.

Ultimately, however, we must answer the question: Are these drug effects of value in combating the disturbances of functions that are encountered in disease? The final answer to this question can seldom if ever be given from studies either on normal animals or on normal men. In certain instances the diseased function is unusually susceptible to drug action. The body temperature of a febrile patient, for example, is reduced more easily by antipyretic drugs than is the body temperature of a normal person. Digitalis in therapeutic doses has relatively little effect on the heart rate when this is controlled in the usual way from the sinus region. Its reputation for slowing the heart of patients is based almost exclusively on observations which were made on those suffering from auricular fibrillation. Diuretics of the caffein group produce a moderate diuresis in the healthy man, and may be ineffective or harmful in nephritic edema, whereas in cardiac edema they often cause a veritable flood of urine. The dilatation of the bronchi produced by epinephrin is most plainly demonstrable in conditions of bronchial constriction, whether produced experimentally or occurring during asthma. Finally, the treatment of infections can manifestly be tested only on infected animals or human beings.

Not infrequently the remark is made that the value of a therapeutic measure is determined solely by clinical experience. While I have no desire to contradict this assertion, it should be pointed out that ordinary clinical observations are often extremely difficult to interpret, owing to the vagaries of disease and to the many remedies that are so commonly employed in a single case. The past history of therapeutics warns us that in order to avoid error we need as much assistance as possible from every source. Pharmacology may not, indeed, answer therapeutic problems directly, but at least it aids in their solution. It shows how drug action may be made the subject of accurate study, and the critical attitude which it adopts must be carried over into the interpretation of therapeutic results, if progress in that subject is to be placed on a firm foundation.

On the other hand, pharmacologists could, I believe, be of greater help to those who work in the clinic if they would fully realize how their results may be given a form more suited to clinical needs. What, for example, is the effect of a given drug in small doses, especially when given over a long period of time? How are the effects modified when animals have been made the subject of disease? What pharmacologic problems can be studied on man himself, and especially on patients who are taking the treatment usually given for their disease? Work on such lines as these whether by pharmacologists or by clinicians, will help to maintain contact between the science of drug action and the art of treatment.

THE PROTECTION OF THE HEALTH OF THE WORKER IN WAR*

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The preservation of the health of the war worker is one of the most important problems of the next two years and one which, if a correct solution is found from a rational and practical standpoint, may lead to revolutionary changes in the majority of factories in the United States. The health of the war worker is a national asset, and must be scrupulously guarded along the most approved lines compatible with present factory administration. It must be remembered that any revolutionary project, no matter how carefully thought out, is potentially destructive, and that the greatest care must be taken in introducing reforms and changes to do so in such a way that maximum results can be obtained with a minimum amount of expense and change from existing conditions. In this paper I shall present briefly the experimental and practical data which apply to the protection of the health of the war worker, and a definite system of organization which is applicable to all factories doing war work and employing 1,000 or more employees.

HEALTH IN RELATION TO PRODUCTION

"Health is a condition of physical soundness or well being in which an organism discharges its functions efficiently."[1]

To maintain health means to maintain working efficiency, while reduction of health means loss of efficiency. Sickness decreases the individual's production, increases the risk of accident, and militates against the efficiency of the department. An epidemic of sickness can completely disorganize a department or even a whole shop.[2]

Health may be affected (1) by outside factors (environment, fatigue, accident), and (2) by internal factors (disease and defects).

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* Read before the Section on Preventive Medicine and Public Health at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Encyclopaedia Britannica, Ed. 11, 13.
2. Newman, George: Sickness and Injury, Memorandum 10, British Health of Munition Workers Committee, 1916.

OUTSIDE FACTORS

(*a*) *Environment.*—In factory work the health of the worker is menaced by three factors of environment, each of which can to a certain extent be overcome. These are poor ventilation (which should be coupled with heat and humidity), poor light, and dust. We will consider these briefly in order.

In muscular activity the glycogen of the muscle unites with oxygen from the blood, producing heat and combustion products, the most important of which is carbon dioxid. During work such as that done by the average factory worker, the amount of carbon dioxid thrown off in the expired air is about double the amount that is thrown off by the same person at rest. Along with this carbon dioxid there are thrown off by the working body emanations containing toxic protein products. These toxic products cause the odor and closeness of an ill ventilated room.

Recent investigation tends to show, however, that the lassitude, headache, and malaise experienced in a close atmosphere are due to heat and humidity rather than to the inspiration of waste products, and that the effect of heat and moisture on the skin is the determining cause of the discomfort. From these facts it is evident that not only must there be a free circulation of fresh air, but also the heat and humidity of the air surrounding the worker must be within certain definite limits. Briefly stated, factory air should not contain more than six parts of carbon dioxid in 10,000. The temperature should not, if it is possible to avoid it, exceed 68 F., and the humidity should not be higher than 72 wet bulb.

Good light is necessary not only for the health of the worker, but also for the efficiency of his work. This fact has been definitely realized in modern factory construction. Artificial illumination by electricity may be furnished by direct, indirect or semidirect methods of lighting. General semidirect supplemented by shaded individual lights probably give the best practical results. Each worker or group of workers can then control the light over the machine or group of machines being operated. The light should fall on the work, not on the operator's eyes. There are three dangers to be avoided: (1) overillumination, causing overstimulation of the retina and contracted iris; (2) underillumination, producing eye strain, and (3) reflected light from brightly polished metallic surfaces which tends to confuse and to produce the effect of overillumination. Poor illumination, besides injuring the worker and reducing the output, increases the number of accidents.

"The lighting of a factory is deemed to be insufficient if the illumination taken on the horizontal plane, 1 foot above the floor, falls below one third of a foot candle." [3]

(*b*) *Fatigue.*—"Fatigue is a diminution of the capacity for work which follows excess of work or lack of rest; and which is recognized on the subjective side by a characteristic sensation of malaise."[4]

No subject that has to do with industrial health has received more careful attention and consideration than industrial fatigue. The British Ministry of Munitions devotes a whole pamphlet or section of its report to its investigations and findings. Fatigue has also been exhaustively studied by Lee, Goldmark, Mosso and many others. Physiologically considered, muscular fatigue results from (1) poisons produced by contraction of striated muscle; (2) catabolism of the glycogen in the muscles, and (3) consumption of the glycogen stored in the muscles and the liver. Fatigue products are chemical substances acid in reaction. They consist of sarcolactic acid, monopotassium phosphates, and carbon dioxid. These substances circulating in the blood produce fatigue. They act not only on all the muscles of the body, but also on the central and end nerve cells. These waste products are eliminated slowly, and the body requires a period of rest for their complete elimination and the necessary tissue repair. If sufficient rest is not allowed between working days, a physiologic deficit must result. According to Goldmark,[5] "this is the essential injury of consecutive days, weeks and months of overtime work which we (shall) find common to many branches of industry — that the normal season of tissue repair between working days is cut down at the very time when the severest demands are being made on the human organism. Strain or work done after fatigue has set in not only costs more effort but accomplishes less." [2] This has been graphically shown by Lee: [6] "Effort increases with fatigue, but if work is reduced by one half the period of necessary rest can be reduced one half or three fourths as much again."

There are three stages of working power. In the first the working power gradually increases; it is the limbering up stage and is known as the stage of incitement. During this stage the output of the individual worker gradually increases. The second stage begins when the worker has gotten into full swing. This stage is known as the stage of practice; work becomes automatic, speedy and leaves free will for application to the general consideration of the work. After a certain period of time, the duration of which depends on the work, the physical condition of the worker and many other factors, the stage of fatigue is reached. This stage is usually characterized by a spurt or effort on the part of the worker to overcome the lassitude caused by fatigue products. These stages correspond to the action of isolated muscle electrically stimulated. Before fatigue reduces the contracting power of muscle there is a steplike rise, each contraction being more powerful than the last, until a certain height is reached, after which there is first a slow, followed by a rapid, fall in power. We must remember, however, the volitional control of the worker, and this is shown in the spurt. The spurt may occur at any time during the stage of practice, but it is particularly prevalent toward the end of a working period or during the stage of fatigue. This spurt is known as the end spurt, and "occurs where a worker makes a special effort to do his best before leaving off. This effort is coupled with a stage of excitement which is psychological depending on the approaching rest period. During this period accidents diminish."

It is evident on physiologic and psychologic grounds that overwork, an insufficient number of rest periods, and insufficiently long periods of rest all militate against the health of the worker, and increase the danger of accident.[7]

The type of work in different departments varies, and the physical condition of each worker varies. It is obvious, therefore, that to make hard and fast working hours for the whole factory, as is now done, is

3. Oliver, Sir Thomas: Occupations, 1916, p. 33.
4. Ogden, C. K.: The Nineteenth Century and After, February, 1917, p. 420.
5. Goldmark, Josephine: Fatigue and Efficiency.
6. Lee, F. S.: Fatigue, Harvey Lectures, 1906-1907, p. 172.
7. Vernon, H. M.: Output in Relation to Hours of Work, Memorandum 12, British Health of Munition Workers Committee, 1916.

working a grave injustice on the workers of some departments and on the workers not physically fitted to work in certain departments. Therefore, I submit these principles: 1. Whenever possible, the working hours of a department should be governed by the type of work of the department. 2. Rest periods should be introduced as indicated by production and by the number of accidents. 3. In each department, only workers physically fit for the work of that department should be employed.

(*c*) *Accidents.*—Accidents are largely due to workers' so-called "carelessness." In a recent investigation of 1,000 accidents occurring at the Norton Company plant, 85 per cent. were found to be due to this cause. In many occupations, accident is undoubtedly due to monotony, breaking of rhythm, or complexity of work. The rendering of machinery safe is a science in itself, and large factories now employ safety engineers whose business it is to see that machines are fitted with the proper safeguards.

In the scientific consideration of accidents, injured workmen continuing to work should be classed and considered in the same way as are defectives, until they have completely recovered.

The proportion of accidents to sickness is generally considered very low. This is true in regard to time lost from work, but in actual numbers the records of the Norton Company show a remarkable equality. Thus, during the first three months of this year the number of employees applying for dispensary treatment was in the proportion of nineteen cases of sickness to twenty cases of accident.

Accidents should be treated promptly by trained assistants. When serious they should be treated by a physician. By prompt treatment I mean treatment within ten minutes of the time the accident occurs. The exact method of treatment of accidents has been discussed in a recent article.[8]

INTERNAL FACTORS

(*a*) *Defects.*—Physical defects militate against the health of a worker unless he is so placed that the character of his work and his mental ability allow him to keep up normal production without strain and without materially increasing the defect from which he is suffering. A defective worker is not by any means an inefficient worker. Inefficiency occurs only when the physical defect through fatigue or discomfort prevents the worker from producing a normal output. Often defective workers are the best workers in a department, but they will not remain so unless properly supervised. The method of supervision will be discussed later.

(*b*) *Disease.*—Sickness is prevalent among any large body of workers. It is most marked during the four winter months, and is an important factor in causing lost time. Our experience at the plant of the Norton Company during December, January and February, the worst months for sickness, showed that 27 per cent. of the men investigated were absent because of sickness, the remaining 73 per cent. being absent for personal reasons. Approximately 2 per cent. of the working force were absent each month because of sickness. It is obvious that sickness is probably the most important factor to be controlled in considering the protection of health, and I hope to show later the possibilities of reducing this to a minimum.

In considering the foregoing factors which control the health of the worker, it is evident that the responsibility for the workers' health falls on four men: the engineer of the plant, the safety engineer, the manager of the works, and the factory surgeon.

1. The engineer of the plant controls the external factors of environment.

2. The safety engineer controls the external factors of danger.

3. The manager of the works controls the external factors of fatigue.

4. The factory surgeon controls the internal factors of disease and defects.

No further consideration will be given the first three. Each is a specialty in itself.

We will now consider the work of the factory surgeon and the medical supervision of war workers.

The object of medical supervision is to control the health of the working force by instituting methods of prevention of disease and maintaining them; by the prompt attention to accidents and through careful after-care preventing disability as far as possible; by finding defects in workmen and repairing them, and if this is not possible, endeavoring to place the defective workman where he will be most efficient; by the education of the workman in matters of hygiene, and by the control of sanitation and matters pertaining to the health of the factory at large.

PHYSICAL EXAMINATIONS

The keystone of efficient knowledge of the physical condition of the worker is a physical examination. This fact is recognized in every hospital, college and army. With the knowledge gained by physical examination, defects discovered may be remedied, employees may be placed in departments in which their defects will not only not militate against their efficiency but where they may be actually improved. Workers may be stimulated to cooperate with the physician in helping themselves, and the close touch necessary for future supervision and advice established. The value of physical examinations to both factory and worker is becoming more plain each year.

Outside of the specific fundamental data obtained by the examination, perhaps the most important feature is the use of the knowledge thus obtained in placing defectives in their proper departments. With the Norton Company there are at present 401 defectives so placed that they are all doing excellent work and apparently improving rather than retrogressing.

Defects may be divided into two classes: (1) Those which can be relieved by medical supervision and by proper placing, and (2) those which can be assisted only by medical supervision.

In the first class belong defective eyes, defective ears, defective hearts, defective lungs, and certain defects of the extremities. Defective eyes and ears are of particular importance in certain office departments and in shop departments requiring keen vision in the work. Slight refractive errors if not corrected lead to eye strain and poor work, which is of advantage to neither factory nor worker. Slight deafness among stenographers using the phonograph causes great nervous strain, and such work should not be assigned. Defective hearts are more or less of a bugaboo. The average patient with compensated endocarditis is capable of considerable work without

8. Clark, W. L.: Medical Supervision of Factory Employees, THE JOURNAL A. M. A., Jan. 6, 1917, p. 5.

danger, provided sudden or prolonged strain is avoided. My experience tallies exactly with that of MacKenzie, who says: "If the rule that exercise should stop short of exhaustion be followed, it is surprising what an amount of effort can ultimately be endured by patients who may once have suffered from extreme heart failure. This will be appreciated by those who practice among the classes employed in hard manual labor."

The Norton Company has ninety-two workers with defective hearts. Only two of these men have been forced to stop work because of broken compensation, and both after a rest were able to return and are now working. All are, of course, under careful supervision. The question of the seriously defective lung is quite different. Here the function of the health department must be to make an early diagnosis of tuberculosis or pneumonia, and see that the worker receives immediate and adequate care. In neither condition should one be permitted to work, but outside treatment should be arranged. It seems remarkable that not only have many persons with tuberculosis applied to the Norton Company for work, but even a few with pneumonia.

The handling of defective extremities is such a broad subject that it cannot be considered here.

In the second class belong those numerous minor defects so common among workers which if not checked and cared for sooner or later lead to marked disability.

In order that no defective may be transferred from a suitable to an unsuitable department, another physical examination should be made on all transfers, and this, together with the examination which all sick employees should receive at the main or subhospital when applying for relief, obviates the necessity of periodic examination of the entire factory force. Workers with severe defects should, however, be kept under close supervision, and should be reexamined once every six months or year.

Medical supervision should begin with the physical examination of the applicant and continue as long as he continues to work in the factory. He should be provided with careful and thorough examination and advice when he is sick. He should be given prompt and efficient treatment for every accident, no matter how slight, and this treatment should continue until the worker is able to resume work. Medical supervision should preserve the general health of all workers by supervising hygiene and sanitation at the factory, and it should educate by affording an opportunity for direct contact between physician and worker, and by the distribution of leaflets simply and clearly written on health subjects.

The great bulk of sickness among workers is of a minor nature; but unless this is given careful treatment, much more serious conditions are likely to follow. Thus at the Norton Company's plant, where the number of employees in office and shop approximates 4,500, during the first three months of this year, 1,920 patients applied for treatment, of which only 319, or a little under one sixth, could possibly be considered more than minor cases. The whole comfort, and much of the efficiency of the worker, however, depends on the relief of these milder ailments, and many, if not cared for, tend rapidly to become serious.

When we are confronted with figures like these, we realize the necessity of a sickness prevention movement similar to "safety first."

In short, sickness among workers is as prevalent as accidents, and should receive the same care and attention as accidents, if we are to preserve the health of the war worker. The best index as to the amount of sickness and the number of accidents at a factory is the lost time record. This may be divided into time lost from sickness, time lost from accident and time lost for personal reasons. I consider the personal lost time as a normal for sickness. If the sickness curve is lower than the personal curve, good medical service is being provided, and workers are availing themselves of it. During the past year the average number of hours lost from accident per month at the Norton Company plant employing about 4,500 workers was 328, or about six weeks' working time. In other words, the lost time each month was equivalent to six injuries each severe enough to incapacitate one worker for one week.

Good results can be obtained only by keeping a most careful check on each case of accident and sickness and by an efficient follow-up system; in other words, a close personal touch is the keynote of success.

The whole question of the preservation of the health of the war worker resolves itself into education and service: education of the employer as to the economy of preserving the health of his employee; education of the employee as to how to live and how to avail himself of medical supervision. Once this education has been accomplished, success is assured. The proper service is now to be considered.

The instruments of service are the industrial physician, the industrial nurse and the industrial hospital. The industrial physician is a specialist. His equipment and training are special, and more closely approximate those of the military surgeon than any other branch of the profession. His duties and responsibilities have been outlined above. The industrial nurse is also a specialist, and should receive a special form of training. In my experience the most adequate training is that given in the United States Army or Navy Medical Corps. The industrial hospital is a combination dispensary containing both medical and surgical units. It must be equipped (1) to provide room for physical examination; (2) to provide equipment adequate for the treatment of accidents, and (3) to provide for diagnosing all general medical cases and for the treatment of minor medical conditions. These three factors form a unit, and this unit can be extended as far as necessary by multiplication. It is customary, in large factories, to have an employment department where all applicants for positions apply. Therefore, the hospital should be placed in close proximity to this department in order that applicants after being registered may step into the examining room for their physical examinations. This examining room should be in immediate communication with the hospital in order to save the physician's time. It becomes evident that the hospital in connection with the employment department becomes a medical supervisory center and should be situated in the topographic center of the factory if possible. Depending on this main hospital, secondary units may be thrown out, each one complete but small, these in turn being situated in topographic centers of activity throughout the plant. Each subhospital should be capable of caring for accidents and minor sicknesses, and should be in touch with the main hospital by telephone. Each subhospital is in charge of an industrial nurse. This system can be carried out almost indefi-

nitely, is absolutely pliable, and can be adapted to any type of factory. In small factories of 1,000 employees a main hospital alone is necessary. In larger factories one or more subhospitals are placed as indicated by the necessity. One subhospital is capable of handling the accidents and sicknesses of a thousand employees. It therefore can be rapidly figured how many subhospitals will be needed for the service of the employees in a factory.

All records, including physical examinations, should be kept in the main hospital, and all cases appearing in subhospitals should have records made, copies of which should be sent to the central hospital, in order that this record may be entered on the original report of the employee.

An industrial physician should make the rounds of each subhospital daily, and should go over the subhospital records and find out exactly how each case is progressing. If there is any reason to suspect that an employee is not doing well, he should be summoned by telephone and seen by the physician personally. The nurse should also have ready for the physician on his arrival any case which he does not consider himself competent to treat. Any serious cases arising in the subhospitals should be referred at once to the main hospital, or the physician should be summoned from the main hospital to give the necessary treatment.

The advantage of this subhospital system is that every injury is treated within ten minutes from the time it occurs. Redressings are done with great rapidity without the patient's being obliged to wait. Minor injuries and minor sicknesses receive adequate attention at the hands of a specially trained nurse without requiring the time of the physician.

The expense of maintaining a subhospital is less than the expense of time lost by injured and sick employees going a long distance to the central hospital. The records are kept carefully by this method, as every case of injury or sickness is reported directly to the central hospital.

This system has been used by the Norton Company for a year. During that time the subhospitals have administered on an average twenty-five treatments each a day. In the large number of minor accidents treated we have had no case of sepsis.

It must be remembered, however, that only industrial nurses should be given this responsibility, and that the limits of their power to treat cases should be firmly fixed. The industrial physician should remember that he is absolutely responsible for every case thus treated, and should go over the nurses' records with this in mind.

In closing, I feel that I cannot do better than quote the report of the British Health of Munition Workers Committee:

> The committee have received evidence and reports from all parts of the country of the economic and industrial value of the proper organization of a medical service within the factory, and they are convinced that both on grounds of health and of securing improved output this subject demands the immediate attention of employers, and that adequate schemes of treatment, especially of minor injuries, are an important means of preventing loss of time and efficiency among the workers. They recommend, therefore, that provision for organized treatment should be made in every munition factory.[3]

37 Pearl Street.

ABSTRACT OF DISCUSSION

Dr. John R. Williams, Rochester, N. Y.: I think the study of the physical vigor of the worker is quite as important as the physical examination. By the use of the Collin dynamometer it is possible to measure and get a comparative estimate of the physical vigor of every person in this room in a few minutes. By making such observations under the definite conditions which one wishes to investigate, it is possible to determine whether or not the worker is being injured by the occupation.

I have employed this method with satisfactory results in some brief studies on the effect of undernutrition on certain persons. According to Dr. Ales Hrdlicka of the National Museum, Washington, the dynamometer as a means of measuring the muscular tone of the individual is quite as valuable a diagnostic instrument as is the thermometer or stethoscope. The effects of dissipation, bad food, worry, improper ventilation and fatigue, all have an appreciable effect on the muscular tone, which can be measured easily by this instrument. It seems to me that with this very simple apparatus we could readily determine whether the conditions in a factory were promoting the highest degree of efficiency in the worker.

Dr. David L. Edsall, Boston: In regard to Dr. Clark's paper, the present time is, as we know, a time in which things ought to be done as effectively as possible, and not from the accident of impulse. I want to urge the members of this section present, and other physicians whom they may influence, to make themselves familiar in detail with the reports of the British Health of Munition Workers Committee, from the standpoint of being able to give some wise advice to people from the hygienic standpoint; in regard to the control of industries at the present time under pressure because of the war.

Physicians, knowing this subject somewhat, ought to be familiar with those reports, at least they ought to be read, to give some wise advice as to controlling this matter, not through any patriotic impulse, which is wrong, if driving us to do too much, rather than to do a little; but do something based on better knowledge, based on the attitude of men like Dr. Clark, who has had much experience in it.

The other point is this: Medical men have properly had some feeling against the establishment position as that has sometimes been managed. I have not the slightest doubt that establishment physicians are here to stay and are going to increase in number, from the standpoint of doing work well for the public at large, as well as for certain employers of the people at large; but I have in mind that establishment physicians are going to increase, and going to increase in very great numbers, and more than there will be need to increase, unless the profession at large becomes more familiar with problems such as Dr. Clark has been describing. At the Massachusetts General Hospital in the past year or two we have had an industrial clinic running in the hands of Dr. Wright, just a big dispensary clinic of patients of industrial accidents and the effects thereof. He has seen in that time, in that one hospital, about 5,100 people who are exposed to very definite industrial accidents. They have not been recognized by the ordinary familiar methods. Dr. Wright has diagnosed in one year 147 cases of lead poisoning; and the doubtful ones were all proved by finding lead in the stools, or urine, or both. The physician needs to recognize, as Dr. Clark said, that this is technical work and needs technical training; and we need to recognize in the medical schools that we should teach the students something more about this than we have yet done; but the man who wishes to retain the power of competing against establishment physicians has still to recognize that he has got something there apart, but still has to learn it with an open mind, and to realize the fact that he does not know it.

Dr. J. W. Schereschewsky, Pittsburgh: You must remember that it is not men alone that win a war, but, coincidently, our ability to furnish the military establishments with all the supplies they can possibly need. Now the bulk of these supplies is something which we, used as we are to gigantic industrial operations, can hardly conceive of. If we are to

wage this war effectively we must not forget the necessity for maintaining armies which may amount to several million persons. As these are necessarily able-bodied men, they reduce by that amount those available for industry. This means that not only must every industrial worker be more efficient than ever before, but that women must enter industries to a hitherto unprecedented extent.

In order to secure maximum individual effectiveness, we must not only carefully supervise the physical condition of the worker, but each individual must be placed under circumstances and in an environment enabling him to perform a maximum amount of work. Therefore, measures for the conservation of the health of workers are of vital importance to the country.

In order to secure this result, provision must be made for the following: (1) the establishment of minimum standards of industrial hygiene in work places; (2) prevention of occupational diseases and poisonings; (3) medical supervision of workers, and (4) community sanitation.

The object of all these provisions is, of course, not only to secure conditions favoring maximum production, but so to safeguard the health of workers that an absenteeism from preventable sickness shall be reduced to a minumum. One point which was brought out in Dr. Clark's paper must be insisted on, namely, the adaption of the worker to his job and the utilization of everybody, including physical defectives, to the fullest possible degree. We should by no means reject a skilled workman because of a certain minor physical defect, for if he is given work which can be satisfactorily performed without injury to the health, we can utilize him as effectively as though the defect had never existed. Finally, we must not lose sight of the necessity for creating good sanitary conditions in our industrial communities. It will not be enough for us to secure ideal factory conditions and effective supervision of the health of workers while in the working place unless at the same time we see that their surroundings after they leave the factory are also healthful.

The production of effective conservation and utilization of the resources of the nation in this period of national emergency evidently require the fullest cooperation of all the health resources of the country. We cannot hope to put forth our best efforts in carrying on this great struggle into which we have entered unless there is an effective union of all the health agencies of the country.

DR. OSCAR F. DOWLING, New Orleans: Those of us who have been interested and have made investigations know that the best medical training is what we should set as the standard. Recently I had the pleasure of having some health officers say to me that when they got through and returned to their work they would show us "some sanitation." Camp experience has already convinced them that a county or town can be made healthful, something they did not believe a short time ago. If all the medical men not called to the front could serve a term in one of the camps, especially health officials, it would make for cooperation in the enforcement of protective measures. As it is, so few of them know anything of the value and effectiveness of this work.

This war will give us added respect for law. With us, and I presume it is true of every section, in theory the people have now a profound respect for the law, but once written, they think enforcement will take care of itself. No one feels responsible. We will now have an object lesson in the effect of obedience.

DR. HERBERT J. CRONIN, Cambridge, Mass.: Dr. Clark's system of medical supervision of employees at the Norton Plant in Worcester is practically perfect. I would advise the physician, unacquainted with industrial medicine and about to establish medical supervision in a plant, to introduce Dr. Clark's system complete.

The operating expenses of medical supervision in industry must always be the serious consideration of the physician. A too expensive system may fail because the plant may feel that it cannot afford it. General managers ask, "How much does this cost?" Cost will interfere with your plans; it may even discourage you; but industry must be operated for a profit and a return demanded for money spent. The physician can show a large return if he proceeds slowly and spends cautiously. From my own observation of Dr. Clark's system, I consider it a most practical and inexpensive one.

The establishment of a first-aid hospital should be the first step for the physician on taking charge of the medical supervision of employees in industry. Gradually add the allied departments, such as physical examination of employees, visiting nurses, etc., but use the hospital as a center from which these other activities radiate.

DR. R. W. CORWIN, Pueblo, Colo.: The importance and benefit of first aid cannot be overestimated. The day is past when first aid can be neglected in any line of public industry; it must be considered in every branch of work, and, with equal justice, it should be extended to the home. The welfare of the man or employee should first be considered, then his family, and, last, the public or its representative, the employer, but all are vitally interested and should be keenly awake to its benefits and justice.

DR. OTTO P. GEIER, Cincinnati: One point stands out which has not been mentioned, it seems to me, in connection with this paper and the discussion. We talk about shortage of labor and shortage of material; but there is bound to result a shortage of medical attendence as a result of the war. We point to the fact that over on the other side anywhere from 25,000 to 50,000 doctors have been withdrawn from attendance on the civil population. That will mean that there will be a shortage of 20 to 50 per cent. of medical attendance in this country, which in itself means a serious thing to the community and to labor. I think that the medical profession should take such steps as will intensify the plans of preventive medicine, as that is the only way to meet the extra service that is going to fall on the medical profession in this country. The industrial physician through his control of the medical problems of large groups of workers can assist considerably in meeting the problem.

DR. W. IRVING CLARK, JR., Worcester, Mass.: I urge every one to use every influence he has to have established in any factory that he may come in contact with medical supervision of factory employees, for three reasons: In the first place, because it is good for the employee; in the second place, because it is good for the community; in the third place, because it is good for production; and, if you want to put such a small thing in as the fourth place, it makes money for the factory. All of those points have been absolutely proved; and I simply want to make that one appeal to every one. I think that there is great danger at the present time of long hours and insufficient medical attention to the laborers. It is going to reduce the production; it is going to hurt the laborer; and if arrangements were made so that when a factory is established medical supervision is established with it as one of the definite departments of that factory, it would save both factory and workmen in a great many ways.

Contract Practice in the Netherlands.—The *Nederlandsch Tijdschrift voor Geneeskunde* states that an agreement has now been signed which puts an end to the discord between the organized profession and certain sickness insurance societies, especially those at Amsterdam. One of the ninety-five clauses in the contract is to the effect that the loss of membership in the national medical association automatically excludes from sickness insurance practice. The practice of the individual sickness insurance physician is restricted to 2,500 adults, and the income limit is, for the unmarried beneficiaries, 800 florins and for the married, 1,400 florins, allowing an extra 100 florins for each child after the first, to a maximum of five. The honorarium for the physician is at the rate of 3 florins per adult and 0.6 florins per child. (The Netherlands florin is a fraction over 40 cents.) For exceptional obstetric cases he is to get 10 florins, and for night visits, 1.50 florins extra. Other clauses state that the physician must not take money from the insurance patients, and do no insurance practice outside the societies signing the contract. A control bureau is provided for, with representatives from the physicians, the societies and pharmacists. The contract covers a five-year period, with optional renewal for three years further.

THE EARLY RECOGNITION OF MULTIPLE SCLEROSIS

WITH REPORT OF THIRTEEN CASES *

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In the experience of European observers, disseminating multiple sclerosis is considered one of the most common organic diseases of the central nervous system, but is spoken of by American writers as of unusual occurrence, Church referring to it as uncommon. There is no evident reason why it should not occur as frequently in this country as abroad, and the only explanation for its infrequent recognition with us must be that many cases are at present overlooked; and if we are to withhold a positive diagnosis until the so-called classical syndrome of Charcot is presented in its entirety, or even a very close approach to this picture, a great majority of all cases of this exceedingly interesting and widely variant congeries will continue to pass unrecognized, for there is but a comparatively small proportion of all cases that present this grouping.

Close analysis of the commonly attributed etiologic factors, when applied to the life history of the process, must lead to the conclusion that the real cause or causes are as yet really entirely unknown. In what manner can previous acute infectious diseases, such as typhoid fever or pneumonia, traumatism, exposure or the puerperium act to initiate the development of succeeding foci of gliosis scattered with entire abandon throughout the sphere of the central nervous system, occurring, receding, with apparent clinical recovery, latent perhaps for years, again and again recurring and receding throughout a course of great chronicity? In what manner is it possible for these long past incidents to so affect the organism as to cause the repeated turning into the blood stream of some genetic agent, probably autotoxic in nature, to attack here and there limited patches of white or gray matter, destroying the myelin sheaths, leaving the naked axis cylinders and the cells largely intact and functioning, although suffering to some extent degenerative effects?

The only conceivable manner in which they can possibly operate, if at all, must be by establishing in the multiglandular system some vice of secretion, thus disturbing metabolism and at intervals pouring a toxin into the circulation. The alternative possibility, setting aside the usually attributed factors, would be some microbic agent acting directly or through its toxins. There is at present no conclusive proof whether the causes are endogenous or exogenous. Krafft-Ebing and Strümpell deny the importance of infectious diseases; Redlich believes the cause is exogenous; Strümpell and Hoffman incline to the endogenous origin of the process, and the peculiar characteristics of the disease certainly favor their position, for in a great majority of all cases no sufficient cause can be found.

In my series of thirteen cases no possible causative factors, even remote, could be found in six. Quite severe trauma had occurred in two, but in each case it antedated the initial symptom by a period of two years, too far in the past to be rationally included as a cause. In two others there had been exposure, one incidental to a country practice and the other to a farmer's life, while with two that gave a history of previous infectious disease, years had intervened. When we consider the many who suffer from these infections and do not develop multiple sclerosis, and the few who do, they cannot be logically regarded as causative unless the sequence is immediate or close. All the cases in this series are of a distinctly or highly neurotic type.

In sharp contrast to the entire uncertainty of all initial etiologic factors is the clear and striking influence of trauma and the puerperium in promoting the recrudescence of symptoms. The importance of both these factors is notably illustrated in Case 1:

REPORT OF CASES

CASE 1.—Mrs. W. M. D., aged 30, housewife, came under observation, Jan. 22, 1917, having been referred by Dr. A. A. Laurent. Her family history was good, but she had had much trouble with tonsillitis as a child. When 15 years old she got wet at the time of her menstrual period. This was followed by what was called "dropsy" in the legs, and she could not walk without support at this time. She recovered and was married at the age of 17 and has had eight children. Following the birth of a child four years ago she could not walk well; the legs felt clumsy, and became almost powerless in five months; but she gradually got so she could walk quite well (never naturally), but could not run. With the birth of a child seven years ago she had weakness in the left arm. This hand was numb for a time, with the attack four years ago. At that time she had a severe fall on the steps and thinks she was made permanently worse by it.

About two years ago, after the birth of a child, her legs began to grow worse, and numbness again developed in the left hand. She had another fall at this time and was numb to the waist for three weeks, and the left leg has dragged more since then. This leg has always been the weaker. At times she has a sensation as if something were dropping in front of the eyes—black spots and flashes. She had a little trouble with speech seven years ago, and friends tell her that her voice has changed. She had some occipital headaches two years ago. Her memory is somewhat impaired. She has pyorrhea and several devitalized teeth. She is subject to sharp and sudden changes in ability to walk. She is in a good state of nutrition and has good color. She has a slight hitch in speech at times. The right pupil is somewhat the larger; both react sluggishly. There is an irregular moderate lateral and vertical nystagmus. The facial muscles and tongue are free. The right tonsil is large, and has some pyorrhea. The reflexes at the right elbow are sharper than at the left. The patellar responses are sharply overactive and equal. There is no clonus, but there is a Babinski reflex on both sides and an Oppenheim sign on the left. While abdominal reflex is lacking, epigastric is present and greater on the left. There is slight diminution of tactile sense over the left hand. There is distinct ataxia of station, and the gait is uncertain and somewhat stiff. Steps are short, with moderate limp in the left foot. There is no intention tremor, but some incoordination. A roentgenogram of the spine was negative. The eye grounds are normal. The Wassermann test of the blood was negative.

Case 2 shows the importance of the puerperium alone:

CASE 2.—Mrs. V. B., aged 23, came under observation, Nov. 1, 1915. She was seen in consultation with Dr. J. H. Higgins. The family history was not significant.

The patient had measles at the age of 3, but no other acute illnesses, accidents or exposure. She was always anemic and suffered from chronic constipation. At the age of 19 she suddenly noticed that the hands were clumsy and shaky when she tried to use them. A day or two later she found difficulty

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* Because of lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints. A copy of the latter will be sent by the author on receipt of a stamped addressed envelope.

in walking, staggered, and had to hold something for support. There was some difficulty also in speech. This condition continued for three months, then largely but not completely cleared up. Numbness has been present in the hands and feet, but has now entirely disappeared. Speech also has become normal. There was also some dizziness. She gave birth to a child in May, 1915, and soon afterward noticed difficulty in walking and a numb feeling in the hands and feet. She had dizzy attacks, and in about two weeks got so she could not stand alone. She could not write legibly for a long time. No trouble was noticed with her speech. The right leg has been worse than the left. She is pale and poorly nourished. The pupils are negative. There is a quite marked nystagmus, lateral, rather slow, of quite wide amplitude and jerky. The corneal reflex is active, the pharyngeal somewhat slow. The face reflexes are negative, the face muscles free. The arm reflexes are negative; the grip weak and equal. The hands show very slight tremor and distinct incoordination. The gait is spastic-ataxic, chiefly ataxic, and there is marked ataxia of station. Speech is good. The patellar reflexes are overactive and about equal. Achilles reflex, clonus, and the toe sign of Babinski were demonstrated. Oppenheim and Gordon signs were present on the right, and there was a slight Babinski reflex on the left. The pulse was 72; pressure, 120 systolic, 85 diastolic; sounds clear. There was distinct improvement under fibrolysin. The patient was seen again, Feb. 17, 1917. She was now able to walk alone with difficulty; the condition varied at times, but in the main was stationary. During the past week the vision had become very dim; she could not read ordinary type at all. Dr. Pratt reports nothing except pallor of the disk. Vision is not improved by refraction.

The characteristic oscillation of the hand, or it may be of the head or leg, commonly denominated intention tremor, is distinct from the element of incoordination, but is probably closely allied with it. This occurs in only a moderate percentage of cases, and not always continually. Speech defects vary from a simple flat or monotonous tone, or slight dysarthria, to stuttering or occasionally showing complete scanning type, being present in only two cases here recorded, while some form of disturbed articulation was found in eight. One of the most frequently observed motor phenomena is nystagmus, said by Redlich to occur in about 50 per cent. of all cases. If the eye muscles are tested by being put in position of extreme imbalance laterally or vertically, a distinctly larger proportion will probably show this sign, and it may vary widely in amplitude, rapidity and rhythm. It was readily demonstrated in eleven cases of this group, and in the remaining two, the patients had poor fixation of the globes. Diplopia is found occasionally, but is not frequent.

The pupils often show distinct inequality, one being larger than the other, but this difference is often variable, present at one moment and not at another, or it may be constant. The light reflex may be sluggish; accommodation is usually normal. Ordinarily the pupil is circular, and the iris never takes on that flat, tightly drawn tense look; the velvety softness is gone, a condition as characteristic of the tabetic eye as the Argyll Robertson sign, but which I have never seen mentioned in any text. Disturbances of vision are of moderate frequence, occurring early, according to Stölting; in about one third of all cases, being the exact percentage in this series. It varies from simple dimness to irregular restriction of the field or amblyopia, sometimes with a degree of optic atrophy or some choking of the disk.

In the congeries of symptoms, subjective and objective, that unfold before the observer, we approach a most fascinating study. While the advent of the initial manifestation is usually abrupt and marked, it may at times be vague and indefinite. Perhaps an irregular and patchy hysteroid area of disturbed sensation, involving one or all of the sensory percepts, may herald its advent, or an immediate loss, in part or whole, of motor power in one or more extremities, or sudden dimness of vision; and not infrequently an apoplectiform attack may prove the prelude to many scenes to follow, as occurred in the following cases:

CASE 3.—Dr. J. P. V., aged 57, a physician, married, came under observation, Jan. 26, 1916. His father was of a nervous temperament, and there was also some tuberculosis in the family. The patient has worked had, and is of a nervous temperament. He had "writer's cramp" some years ago; he had also "neuritis" at the right shoulder, and intercostal neuralgia. He wrote with the left hand for a time. The right hand has never been fully useful since. He had a spell of sudden unconsciousness twelve years ago, with a good deal of dizziness after that. He is subject to sinking or fainting spells on exposure to cold or fatigue.

About three or four years ago he began having trouble with his speech; he could not pronounce words clearly, and a tremor of the head developed. He noticed also increased difficulty in the use of the right hand, and some tremor on closely adapted movement. He had no trouble with his legs. There has been no dizziness of late. He had some cramplike pain in the foot a year ago. He has control of the bladder, and there is no change in the sexual function. Color and

TABLE 1.—SUMMARY OF FINDINGS

Possible Etiologic Factors:	
Trauma	1 (2 years previous), 1, (2 yrs)
Condition aggravated by trauma	2
Exanthems	measles at 3, pneumonia at 10
Condition aggravated by pregnancy	2
Neuropathic heredity	4
Marked pyorrhea present	2
Miscellaneous	anemia, 1, frail, 1
Exposure, including overtax	5
Tonsillitis	1
Gonorrhea	1
Age at onset	14, 15, 15, 19, 21, 23, 23, 25, 27, 37, 42, 45, 69
Initial Symptoms:	
Dimness of vision	1
Motor disturbances	5
Sensory and motor disturbances	2
Apoplectiform	3
Extreme headaches	1
Sex:	
Males	6
Females	7
Symptoms:	
Inequality of pupils, 55 per cent.	7
Sluggish reflex of pupils	2
Nystagmus, 85 per cent.	11
Poor fixation of globes	2
Speech disturbances	8, 60 per cent. (only two being true scanning)
Intention tremor	5 (3 of these slight)
Tremor of head	2, 53 per cent.
Paresthesias, including hypesthesia:	
Hypalgesia and thermal sense	11, 85 per cent.
Motor disturbances:	
Monoparetic	3, trophic changes (with fibrillation) 1
Paraparetic	7, 85 per cent.
Hemiparetic	1, propulsion, 1
Disturbances of coordination	10, 80 per cent.
Disturbances of Vision:	
Dimness	4, 35 per cent.
Diplopia	2
Qualitative Changes in Deep Reflexes:	
Heightened	11, 85 per cent.
Abolished	1
Changes in epigastric and abdominal reflexes (usually diminution or loss on one side)	10, 80 per cent.
Pharyngeal reflex absent	2
Control of bladder lowered	5
Stereognosis diminished	2
Spontaneous Remissions:	
Marked	9, 70 per cent.
Slight	1
One case too recent, but showing marked improvement under treatment	
Marked vertigo	4, 30 per cent.
Severe headache	4, 30 per cent.
Mental Effects:	
Lowered memory and attention	2
More emotional	1
Depression	1
Results of Treatment:	
Improved under fibrolysin	6
Not improved under fibrolysin	1
Now under treatment	1
Not treated	5
Wassermann and Nonne tests, and cell count	Negative in all cases tested, 5

nutrition are fair. He has a halting, tripping difficulty in speech, and the tone is rather flat. He uses his lips peculiarly in speaking. There is no nystagmus, but fixation is not sustained when looking to the left. There is some rhythmic tremor of the head at times; the right hand also shows tremor on movement, slight but distinct. Arm and leg deep reflexes are negative. Epigastric and abdominal reflexes are much less on the right than the left. The cremaster is normal; there are no disturbances of cutaneous sensation, and no paralysis; there is some pyorrhea. The pulse is 76; pressure, 124 systolic, 90 diastolic. The heart sounds are clear. The urine is negative.

Case 4.—Mrs. O. F. K., aged 45, came under observation, Feb. 6, 1917, having been referred by Dr. G. W. Bass. The family was of a nervous temperament on the mother's side. The patient was frail as a child up to 8 years of age. She was not fond of school; she was in the eighth grade at the age of 19. She had no serious illness. There were three children, all normal. When 15 years old she had "water on the left knee" for a year. One morning, three years ago, she had a sense of confusion, became unconscious, remained so for three days, and was in a dreamy state for several weeks. She has never felt well since then, is dizzy all the time, her memory is poor, and she is absentminded, has little interest in things, is inclined to be gloomy and cry, and is in a constant state of worry. The bowels are regular, and she has full control of the bladder. There is a numb and weak feeling in the left leg that is increasing. She often staggers about the house. She has cramps in the left lower leg at night, and also at times in the hands. The urine has been slow in starting the past four months. The patient is well developed and well nourished and her color is good, but her expression is dull. The right pupil is slightly larger than the left, but both are small and react poorly to light, somewhat better to accommodation. The arm reflexes are all sharply exaggerated and equal. The face reflexes are negative. Speech is free. Fixation of globes is not good, but there is no actual nystagmus. There is quite marked intention tremor in both hands. Patellar response is markedly increased on the right, less so on the left. There is no clonus, but a distinct Babinski and Oppenheim reaction on both sides. Station is fair; there is some ataxia of gait and the step is short, favoring the left leg. There is slight dulling of pain and tactile and thermal sense over the right arm and leg. There is marked anesthesia and analgesia throughout the left leg. Epigastric and abdominal responses are absent on both sides to stroke. Epigastric response is present on both sides to tap, but is distinctly greater on the right.

Usually the subject is a young adult under 30, there being no predilection for sex.

In the present analysis one began with extreme head pain, one with sensory involvement alone, five with pure motor disturbance, two with combined sensorimotor trouble, one with dimness of vision, and three with an apoplectiform picture.

The progress of the individual case is strikingly variant and irregular. Areas of paresthesia suddenly develop, extend or remain stationary for indefinite periods and gradually diminish or disappear. They may occupy any site, may be monoparesthetic, paresthetic, or hemiparesthetic in distribution. They may or may not be accompanied by corresponding disturbances of motor function. The gait may be slightly or profoundly affected, mostly spastic or almost entirely ataxic, and of the cerebellar type, this being evidently due to plaques in the peduncles.

The reflex phenomena are striking and significant. While a simple quantitative increase may possibly be the only alteration noted, in practically all cases there are definite qualitative changes, with either an ankle clonus, or the great toe sign developed in the Babinski, Oppenheim or Gordon test, on one or both sides, or perhaps a clonus on one and a Babinski on the other. In one rare case of my group, all these reactions were found on both sides.

Case 5.—Olaf O., aged 26, single, a Dane, entered City Hospital, Jan. 19, 1915. The family history shows no significant factors. The patient had pneumonia at the age of 10. He came to this country at 15. He is a heavy smoker and has had gonorrhea twice.

Three years ago he noticed difficulty in walking. He had chills and cold sweats. This improved for a time, but then became much worse; he could not stand or walk; the right leg was completely paralyzed. He took mud baths for three months, improving somewhat. The bowels are constipated, but he has control of the bladder. He has a sharp pain in the abdomen at times. The lower legs are cold. The vision is hazy. He has had headache for three weeks. The patient is well developed and in good nutrition. His manner is nervous, speech hurried but with slight trip in it. The right pupil is slightly larger at times. There is a marked rhythmic, lateral nystagmus of quite wide amplitude; there is reaction to light and accommodation.

The arm reflexes are sharply increased and equal, and there is no intention tremor. There is slight incoordination in the arms; very slight diminution in tactile sense in the hands; marked unsteadiness in gait and station, and a spastic element. The legs show overextension at the knees. The patellar responses are sharply exaggerated and equal. There is ankle clonus on both sides. The great toe sign is present on both sides in all three tests. Appreciation of touch, temperature and pain stimuli is markedly reduced over both legs. The cremaster is active and equal. The epigastric and abdominal reflexes are abolished on the right and present on the left. For a time the right leg was much weaker, then gradually improved. The Wassermann test of the blood was negative. All reactions of the spinal fluid were negative.

Intramuscular injection of fibrolysin was employed for about two months, with apparent improvement in the use of legs and in vision.

While, as has been stated before, the reflexes are commonly heightened, in an occasional rare case they may be abolished, as they were in Case 6.

By some writers the superficial reflex reactions are not considered of material importance, but variations in the epigastric and abdominal responses are highly significant. They will usually be found active on one side and diminished or lost on the other. This was true in ten of these patients.

Disturbances in sense perception are not usually considered as frequent as those in the motor sphere, but if both subjective and objective changes are included they are probably fully as common and possibly more so; and thermal hypesthesia may be more pronounced than the diminution in either tactile or pain sense, as in Case 13.

Case 7.—Mrs. E. J., aged 35 years, housewife, came under observation, May 14, 1917. She was seen in consultation with Dr. E. G. Warne, St. Paul. The family history was negative. The patient comes from a family of very large people, and she was always large for her age. She matured at the age of 11. When 14 she had trouble with dimness of vision, and had glasses fitted. She was told she had cataract. The vision gradually cleared entirely. She had no material illnesses as a child. She was married at the age of 18, had two children, the last fourteen years ago, and she had several abortions, the last eight years ago. When about 20, she had trouble in walking. From time to time she has had numbness in the extremities, worse in the right hand and left foot. Vision at times has been misty and then cleared; she thinks she sees better in the evening. She has sudden temporary increase in the difficulty in walking or the feeling of numbness. Several years ago she had an interval of severe headache; dizziness is constant. Fifteen years ago she had a large fibroid removed. Menstruation is growing gradually less. Last summer she had a faint feeling; everything grew black.

She had another attack four weeks later which lasted several hours, although she was not entirely unconscious. She tires easily, and the difficulty in walking and the numbness are aggravated. There is no diplopia. She had tremor of the head for a time. She could not write last winter. She had her feet scalded and she did not know the water was hot. There was loss of control of bowel and bladder for a time last winter. Control is now partially restored. She is very large, and weighs 240 pounds; her color is good. The left pupil is large at times; both react. The jaw jerk is sharp; the teeth show much dental work, the arm reflexes are negative. There is no tremor of the hands. There is a marked vertical nystagmus on looking to the left, but slight when looking to the right, of rather wide amplitude and

TABLE 2.—ANALYSIS OF CASES

Case No. and Age at Onset	Causative Factors (?)	Initial Symptom	Motor Disturbances	Sensory Disturbances	Speech	Eye Symptoms	Reflexes	Remission (spontaneous)	Serology	Trauma and Puerperium
1—15	Exposure to wet; tonsillitis	Paraparetic	Paraparetic; spastic ataxic gait	Numbness; slight dim. touch, temp. and pain; head pain	Dysarthric (slight)	Nystagmus, both vertical and lateral; inequality of pupils; dimness	Patellar sharp, right; Babinski, both; Oppenheim, left; abdominal diminished, right	Marked	Not taken	Marked recurrences with both trauma and puerperium
2—19	Measles at 3; anemia	Arms clumsy and shaky	Paraparetic; difficulty in writing	Numbness (subj.); dizziness	Dysarthric	Nystagmus; dimness	Clonus, Babinski, Oppenheim, Gordon on one side	Marked	Not taken	Marked increase with puerperium
3—45	Overstrain (country doctor)	Apoplectiform	Monoparesis; tremor of head; intention tremor	Dizziness.....	Scanning	Poor fixation	All tendon responses negative, abdominal diminished on one side	Moderate	Not taken	
4—37	Constitutional frailty	Apoplectiform	Intention tremor; spastic-ataxic; weak detrusor	Numbness; marked dim. all sense perceptions left leg	.....	Poor fixation; inequality of pupils	All sharp; Babinski and Oppenheim; abdominal diminished on left	.....	Not taken	
5—23	Pneumonia at 10; gonorrhea	Difficulty in waking	Monoparesis; spastic-ataxic	Marked dim. touch, pain and temp. perceptions; head pain	Dysarthric (slight)	Nystagmus; dimness; inequality of pupils; diplopia	All sharp, clonus, Babinski, Oppenheim, abdominal absent on one side	Moderate	Not taken	
6—42	.....	Extreme head pain	Intention tremor; gait, spastic-ataxic	Numb and prickly feeling; dizziness	Dysarthric flat tone	Nystagmus; diplopia; dimness of vision	Dull in arms, absent in legs, abdominal, absent on one side	Slight	Negative	
7—14	.....	Dimness of vision	Paraparetic; spastic-ataxic	Numbness; dim. in heat percep.; slight astereognosis; dizziness; head pain	.....	Nystagmus, vertical; inequality of pupils	Patellar sharp, Achilles absent, Babinski and Gordon left, Babinski and Oppenheim right	Marked	Negative	Faint feelings on exposure
8—15	Nervous temperament	Apoplectiform	Monoparetic; intention tremor; paretic gait	Numbness.....	.....	Marked nystagmus; inequality of pupils; diplopia	Clonus and Babinski on left	.....	Negative	
9—69	Pyorrhea	Paraparetic	Diplegic; trophic wasting; spastic-ataxic, weak vesical sphincter	.....	Dysarthric (slight)	Nystagmus	Patellar sharp; clonus and Babinski	Moderate	Not taken	Aggravated by trauma
10—23	Nervous temperament	Local area of numbness	Paraparetic; almost purely ataxic gait; weak vesical sphincter	.....	.....	Nystagmus	Pharyngeal absent; Babinski and Oppenheim on both sides; abdominal absent right	Marked	Negative	Recurrence with overstrain
11—27	Trauma two yrs. previous	Paraparetic	Intention tremor (slight); spastic-ataxic	Slight local paresthesia; slight astereognosis	Scanning	Marked nystagmus; inequality of pupils; dimness	All sharp, Babinski, Oppenheim, Gordon, both sides; abdominal abolished	.....	Negative	
12—21	Nervous temperament	Weakness and numbness in legs	Intention tremor (slight); marked incoordination; spastic-ataxic	Numbness.....	.....	Slight nystagmus	Clonus, Babinski, Oppenheim, both sides; abdominal absent one side	Marked	Not taken	Faint feeling from any exposure to cold
13—25	Trauma two yrs. before	Monoparetic	Monoparetic; slight incoordination; weak detrusor	Numbness; slight dim. tactile, marked of thermal perception	Flat tone	Nystagmus; inequality of pupils	Patellar inc. on right, Oppenheim and Gordon on right	Marked	Not taken	Recurrence following trauma

somewhat irregular. Patellar response is sharply overactive and equal. Achilles reflex in absent on the left and slight on the right. There is no clonus. A Babinski and Gordon response on the left and irritation of the skin on the dorsum of the foot produces extension of the great toe. There is a Babinski and Oppenheim response on the right, and there is extension of the great toe on irritation of the skin just above the ankle. There is slight incoordination in the hands. The patient has a spastic-ataxic gait, slight diminution in tactile and pain sense and marked loss of thermal sense; also slight astereognosis in the right hand. The pulse is 84; pressure, 138 systolic, 105 diastolic (radial).

Stereognosis may be occasionally affected. Difficulty in either holding or passing the urine, transitory or more continued, is not infrequent. More or less severe and persistent vertigo is rather common, severe headaches are not considered a frequent occurrence, but were noted in more than one fourth of these cases. Intellection is not materially compromised, but there may be slight reduction, and somewhat lowered power of memory on increased emotionality.

Ordinarily there is little difficulty in arriving at a positive diagnosis. The clinical combination is unique, presenting both cerebral and spinal symptoms pointing to multiple, widely separated foci. It is not important what these individual symptoms are, provided we have any one characteristic spinal and cerebral sign combined. It may be, for instance, a clear lateral or vertical nystagmus and motor disturbance in one leg, including qualitative disturbances in the deep reflexes, which constituted the picture in Case 8.

CASE 8.—Miss Martha W., aged 19 years, was referred by Dr. M. J. Jensen, and came under observation, June 19, 1916. Her family history shows no important elements. Her health was good up to four years ago, when she had a "fainting spell." She had another two years ago and a third a few months ago.

About a month ago she noticed numb feelings in the left hand (the patient is left handed). She has had some diplopia at times. For several weeks she has noticed that she could not use the left leg naturally, dragging the foot. She has not noticed any trouble with speech. She has very little headache, but some dizziness. There is no trouble with the right

extremities. She has slight numb feelings throughout the left side, and these were marked just before one of the fainting spells. Menstruation is normal. There are no disturbances of bladder or bowel; no nausea or vomiting, but possibly some muscular twitching in upper left arm.

She is in good nutrition and color. The left pupil is slightly larger than the right; both react well. The facial reflexes are negative, except of jaw, which is sharply overactive. The teeth are negative; the tongue is free. There is marked lateral nystagmus of fine character and somewhat irregular rhythm, greater to the right than to the left. The arm reflexes are active, the left elbow being greater than the right. Patellar response is sharp, more so on the left. Sustained clonus on the left, partial on the right. The toe sign is atypical on the left but the Babinski reaction is not complete. The left hand is slightly uncertain in movement. She drags the left foot slightly in walking. Epigastric and abdominal reflexes are absent on stroke, elicited on both sides on tap, distinctly less on the left. There are no objective disturbances of sensation. Pulse is 90; pressure, 115 systolic, 85 diastolic (radial). The spinal fluid and blood are negative to all reactions. The urine is negative.

The patient was reexamined, Oct. 19, 1916. After the use of fibrolysin by Dr. Jensen, she walks well, with no dragging of the foot. The pupils are negative. There is possibly a slight drawling in speech. Nystagmus is still present, but less pronounced. Stereognosis is good. The left hand is slightly uncertain on adapted movements. The patellar and elbow reflexes are greater on the left; also the Achilles reflex. There is no clonus on either side, but a distinct Babinski reaction on the left side. The pulse is 84; pressure, 120 systolic, 85 diastolic (radial). Continued improvement has since been reported by Dr. Jensen.

May 10, 1917, the patient reported that the left leg did not yet feel normal, and that the left hand was shaky when holding anything. There was slight divergence of the left eye. Nystagmus was marked when looking to the left, slight to the right. The pupils were negative. There was marked intention tremor in the left hand, also slight incoordination, but no disturbance of speech; there was a clear Babinski on the left.

There may be only disturbance in vision and spastic-ataxic gait with altered deep reflexes, or irregular hysteroid areas of paresthesia and nystagmus, or disturbance in speech with an intention tremor. If we have, as a background, also a history of similar manifestations that have come and gone or greatly improved spontaneously, and perhaps repeatedly, or shown sharp aggravation by such incidents as trauma or childbirth, we have valuable corroborative evidence, but they are not essential to a conclusion. When we have either spinal or cerebral manifestations alone, a positive diagnosis cannot be made; but the development of speech disturbances and a nystagmus in a young adult, or the advent of a clear intention tremor and a monoparetic condition with qualitative reflex changes are very strongly presumptive. The cases in which a definite conclusion is more difficult are those with a wealth of symptoms, such, for instance, as the rare form with trophic disturbances, in which unusual destruction or marked damage to gray cells is accompanied by muscular wasting, fibrillation and contractures closely resembling amyotrophic sclerosis. In such a case, positive determination must await the further development of the picture, beautifully illustrated by Case 9.

Case 9.—A. S. S., aged 70 years, married, a French farmer, came under observation, Jan. 26, 1917, having been referred by Dr. W. J. Byrnes of Minneapolis. The patient's family history is without note. He has always been well and vigorous, and has worked hard. In March, 1916, the weather being rather cold, he drove about 5 miles one day, feeling well on getting into the buggy. When he got out he found he could walk only with difficulty, and has never walked well since. He improved somewhat in the early summer, but had a fall in July and has been worse since. The right arm began to grow weak immediately, and now the left arm is growing weak. He has had no trouble with sensation. There is some difficulty in holding the urine of late. He has some aching and pain in the small of the back. He has noticed some fine twitching in the arms, and thinks there is some loss of size in the legs and decidedly so in the muscles of his hands. He has had bad teeth; many grew loose and fell out. He has had some trouble keeping his balance, and is now unable to walk without assistance. There is a little difficulty with speech and no trouble in swallowing.

The patient is well developed, in fairly good condition of nutrition, his color is good, and he looks young for his age. His face muscles and tongue are free; the pupils are negative. There is a fine and rapid lateral nystagmus. The arms are weak and somewhat stiff in movement. There is quite marked fibrillation in the muscles throughout both arms. There is distinct loss of volume in adductors of thumbs and the interossei, but very little if any at the thenar eminences. No fibrillation in the leg muscles is seen. At the right shoulder marked limitation in motion is noted. The grip is very weak and about equal. All arm reflexes are accentuated. The patellar response is sharply overactive and about equal. There is a well developed clonus and Babinski response on both sides, but no Oppenheim or Gordon reflex. The ankles are rather stiff. He takes short, stiff, unsteady steps with assistance. His speech has a slight hitch at times. The pulse is 88; pressure, 143 systolic, 110 diastolic (radial). The heart sounds are clear, and the urine is negative.

Few diseases of the central nervous system bear even a remote resemblance to multiple sclerosis. So-called pseudosclerosis, a very rare disease, begins in young children, has familial elements, no sensory disturbances, nystagmus rarely or never. Psychic defects are marked. Closely related to this is the equally rare diffuse sclerosis, which has almost identical symptoms.

Acute disseminating encephalomyelitis has febrile onset, no optic nerve disturbances or nystagmus, and no recurrences. Areas of multiple softening can be differentiated at times only by the disclosures of the further progress of the case. Tumors affecting the cerebellum may simulate for a time, but extreme headaches, projectile vomiting, and the further unfolding of the picture will make conclusion clear.

Cerebrospinal syphilis has often a similar appearance in some particulars, but never has intention tremor or scanning speech, and severe back pains are common, but are not present in multiple sclerosis. Gould confuses the two, and imputes to syphilis the chief rôle as the cause of the latter condition. Kaplan is undoubtedly right in stating that one of the chief differential proofs is the serology of the spinal fluid, and that syphilis when present is only coincident and not causal. In the five cases of this series in which the spinal fluid was examined, all were negative to all reactions.

As hysteria may simulate any disease, or be associated with it, we must always keep it in mind; but true nystagmus, or qualitative changes in the reflexes, are never functional. The sensory disturbances in multiple sclerosis, however, are often hysteroid in outline and may lead to serious error easily avoided if reflex changes, nystagmus or other characteristic signs are also found. This type is well illustrated by Case 10.

Case 10.—C., man, aged 31 years, married, came under observation, Nov. 6, 1916, having been referred by Dr. J. Warren Little, Minneapolis. His father was of a nervous

temperament and his mother "at times dragged a foot." The patient is the youngest of six children. His father was 54, the mother 44, when he was born. He is of a nervous temperament, but his health was good until about eight years ago, when, while working very hard, he began to notice a drop in general condition of health. Then numbness came on in the right arm and side of the body down to the groin; this lasted for five months. In 1912 a numb area developed in the left arm and side of the neck but cleared in about a month. In 1913 the feet and lower legs were numb for about a month and in 1914 he had several numb patches over the body. Some difficulty in walking accompanied this attack, which cleared up in about a month's time. He has been a heavy smoker and has used a good deal of coffee. The present attack came on about a month ago. He had been carrying more responsibility than usual before this occurred. Numbness developed, with difficulty in walking, the lower body and legs throughout being numb. He has a little difficulty in holding the urine. There is no venereal history.

The patient is well developed and in good nutrition, with a highly neurotic eye. He is prematurely gray. The pupils are negative. The field of vision is apparently normal. There is a distinct lateral nystagmus of moderate amplitude. Pharyngeal reflex is absent. The ears are large and prominent, the hands steady. The arm reflexes are negative, and the patellar response is overactive and equal. There is no clonus. Both great toes show a slight but distinct upward tendency to both Babinski and Oppenheim tests. The epigastric and abdominal reflex is absent on the right. There is a slight epigastric reflex on the left. There is no objective loss of sensation. The gait and station are good. A quite marked incertitude in gait developed shortly after the first examination, with only slight spastic elements. The urine is negative, and the blood and spinal fluid are negative.

Six ampules of fibrolysin were given, resulting in rapid improvement in gait, which became practically normal in a month; nystagmus was much diminished.

Disturbances in the gait, the pupil and the sensory sphere are the only possible points of remote resemblance to locomotor ataxia, those of sensation being the most similar. The gait is markedly different. While the pupils may vary in size in both conditions, in locomotor ataxia they are irregular in outline, and response to light is affected and the iris has lost its normal velvety softness of texture and has a tense flat look like a tightly drawn curtain, presented earlier in this context as a new sign in that disease. There is less excuse for confusing these two diseases in diagnosis than almost any other that can come into consideration, and yet the following classical Charcot syndrome was designated as tabes even by a neurologist:

CASE 11.—Miss K., aged 35 years, came under observation, April 19, 1916, having been referred by Dr. A. Gullickson. There was nothing of note in the family history. The patient was well until 20 years old, when she was thrown out in a runaway and was unconscious for perhaps five minutes. There were no surface injuries, although she was slightly lame for a time. About two years later trouble began in the use of her legs. This has steadily increased down to the present time. Slight trouble in holding the urine began about five years ago. This difficulty has increased slightly. There has been no trouble with the bowel. There has been some peculiarity in sensation in the left thumb and forefinger for the past two years. She has had some difficulty in getting words at times. Her vision is somewhat dimmed. There is no vomiting, headache or dizziness, and no diplopia. Her memory is normal. Menstrual periods have been too frequent of late. She is gradually losing flesh, and is quite emotional and irritable.

The patient is poorly nourished, and her face is highly flushed. The pupils are moderately dilated, the right being distinctly larger than the left. Reactions are sluggish to both light and accommodation. There is marked nystagmus of moderate amplitude, lateral, and more toward the right. She has several devitalized teeth. The throat is negative. There is slight tremor of the left hand on closely adapted movement. Her handwriting is very irregular. There is slight diminution of sensation in the left thumb and forefinger, and slight astereognosis. The arm reflexes on the left are sharper than on the right. Patellar reaction is decidedly overactive, greater on the right. Clonus is nearly sustained on the left, and there is a Babinski, Oppenheim and Gordon response on both sides, more marked on the left. There is decided ataxia of station. The gait is spastic-ataxic. Abdominal and epigastric reflexes are absent on both sides to stroke, but slightly responsive on the right to tap. There is slight dulling of tactile sense over the legs. Pain perception is normal. There is distinct slurring and trip in speech, but not actually scanning. The pulse is 72; pressure, 122 systolic, 90 diastolic (radial). A Wassermann test was not made.

The patient is very emotional and irritable. There is an element of propulsion in the gait. She was under observation for six months, a total of about 30 ampules of fibrolysin being used, with distinct gain in general nutrition, control in walking and in strength.

The course of multiple sclerosis is one of great chronicity, extending over a period of many years. Symptoms develop, are added to, shift or remain stationary for indefinite periods, or recede and disappear spontaneously, to remain latent perhaps for years, only to again recur, sometimes with identical, sometimes with widely different manifestations. This remarkable characteristic makes conclusions on the effect of any medication very uncertain; but when we find prompt and distinct improvement beginning and continuing on the administration of any medication, it is fair to conclude that it exercises at least some beneficial influence over the process. In this series of thirteen patients five did not remain under observation; of the others one showed no improvement with intramuscular injection of fibrolysin, one has only begun treatment, and the remaining six all showed either moderate or decided improvement, one with rapid and practically complete disappearance of all symptoms. Whether further recurrences will be influenced at all is at present uncertain; and the presentation of this paper with its limited group of case reports has been prompted chiefly by a desire to stimulate interest in closer attention to the protean pictures presented by disseminating multiple sclerosis; its earlier and more frequent diagnosis, as well as a more critical study of its causes, and possibly better methods of treatment.

ABSTRACT OF DISCUSSION

DR. A. L. SKOOG, Kansas City, Mo.: The differential diagnosis of multiple sclerosis from cerebral syphilis is often difficult to make. There is a diffuse arteriosclerosis affecting the brain and spinal cord. The diffuse scleroses perhaps do not fall under the group of multiple sclerosis. It has been said that we need not consider syphilis as a cause of multiple sclerosis simply because the serologic tests give the sign. I agree heartily with this. When we consider the large number of persons afflicted with syphilis, it is not surprising that some of them develop multiple sclerosis. We have had illustrated the same fact with tumors of the brain. I wish to cite a case under my observation about one year. The man was doing interior decorating on a government building when he developed his first symptoms of multiple sclerosis. A number of volatile oils were used in this work. He was informed by physicians and believed that his trouble was caused by inhalation of these fumes. The other workers did not work as long hours as he did. The onset was rapid, making one think of acute multiple sclerosis. During the past year the disease has taken the ordinary course, and now he has

all the classical symptoms. He is in a bedridden, helpless state. Serologic analyses are negative. Personally, I do not think the volatile oils had anything to do with causing the disease. I believe multiple sclerosis is caused by some teratologic defect which becomes evident at a selected development epoch.

DR. E. E. MAYER, Pittsburgh: Believing, as I do, in the infectious origin of multiple sclerosis, Minneapolis must be a very unhealthy place. I am surprised at the large number of cases that Dr. Crafts has observed. Even at as high a percentage as is observed in institutions, namely, about 1 per cent. of all nervous diseases, his number averages high. We do not secure many necropsies in Pittsburgh. A consultant, I believe, in the early stages cannot often positively diagnose multiple sclerosis. The family physician rarely returns these patients for further study, and if they go to state institutions we lose track of them. My low number of multiple scleroses may be accounted for in that way. But the many multiple inflammatory myelo-encephalitic processes and the numerous cases of syphilitic meningo-encephalitis are not diagnosed by me as multiple sclerosis, though I know that later, if I saw them, I would perhaps make this diagnosis.

DR. CHARLES R. BALL, St. Paul: In the United States we have been slow to recognize the protean symptomatology of multiple sclerosis, and Dr. Crafts' paper has called our attention sharply to this fact. Multiple sclerosis has an extensive symptomatology which is often much different from the classical description given in most textbooks. We must get, in general, a broader conception of this disease and then we will find that it is not at all an uncommon affection.

DR. D. I. WOLFSTEIN, Cincinnati: We do not see as many well developed cases as are shown in European clinics, but we do see cases rather frequently in which the diagnosis is justified. Long ago attention was directed to the so-called cases of "formes frustes," and most of the suspicious cases fit into this designation. Often there is difficulty in distinguishing between this disease and hysteria, but if one keeps a sharp lookout for organic signs, such as a Babinski sign or mild clonus, or slight rigidity, the proper diagnosis may be made. I have a case now which shows a marked astereognosis of the affected hand, and this without other involvement of sensation. I wish Dr. Crafts would give his experience on this point of astereognosis. Are there any contributions to the treatment? Is there any value in the silver nitrate method? I have relied on thiosinamin sodium salicylate (fibrolysin) and sodium cacodylate.

DR. G. A. MOLEEN, Denver: The abundance of literature is an index of our ignorance in regard to this disease. In Colorado I have seen a number of cases, but not in proportion to the number mentioned in this paper. It, like other conditions, has an apparent tendency to run in groups. There is one point which was omitted in the paper and that is the frequent mistaking of this condition for hysteria. Risien Russell says that in this condition we make many mistakes, and he was often forced to revise his diagnosis of hysteria. The characteristic striking remissions after very grave symptoms are misleading. This would suggest hysteria, but is, after all, a characteristic of this disease. The character of the disease would lead one to believe that it is constant in type. The eye symptoms mentioned by Kennedy I have never seen. I have seen attenuation of the vessels and glistening appearance of the nerves, with some degenerative patches. Kennedy has seen a number of cases in which there was papilledema. I have thought that the idea that there was some improvement with thyroid was justified. I have had improvement in one case endure for eighteen months on thyroid extract. The patient still shows a slight degree of spasticity in his gait.

DR. B. SACHS, New York: I am sure that now we are recognizing disseminated sclerosis here as frequently as they do in Europe. The early stages must be considered suspicious. The disease is a protean one and the onset varies in many cases. I think that formerly cases were largely classed as chronic myelitis and spastic paraplegia. There is a diffuse myelitic disturbance. Seventy-five per cent. of these cases are early disseminated sclerosis. The absence of abdominal reflexes is a characteristic sign. I must differ with Dr. Moleen. We recognize pallor of half the disk as a symptom of disseminated sclerosis, and a nystagmus confirms this. Stammering is a rare symptom. Intention tremor is less frequent than absence of abdominal reflexes. We will have to improve our diagnostic ability in this particular. The cause of the disease is puzzling. I do not know whether it is hereditary or due to deficiency of glandular secretion (though I hesitate about that), or that there is a toxic origin of some kind, or some basis of deficient development. As for the treatment, we have found no specific. I find a large number of youthful spastic paraplegias that are really early cases of disseminated sclerosis. We can treat the spasticity by massage, baths and electricity. Perhaps we can use sodium cacodylate and push it to the extreme. The disease has remarkable remissions and exacerbations.

DR. FRANK R. STARKEY, Detroit: I have in my care at present a patient with multiple sclerosis with a peculiar onset. The patient, 34 years of age, at the age of 17 became lame in the right leg and was unable to walk without assistance. She went home and rested for an hour, the lameness disappeared and she went to a dance and danced. After three or four weeks the trouble returned in the right knee, particularly; there was, however, no pain. At first the condition would clear up after rest and return with fatigue. The condition grew gradually worse and she was confined to her room for weeks. She took osteopathic treatments and obtained relief. She married, and within ten days the lameness returned and affected both legs and the right arm and she is, at present, unable to stand or walk without assistance. From this description I concluded that the case was one of hysteria and was therefore greatly surprised on examining her to find that she was extremely spastic in both legs, the right arm and both hands. She had increased reflexes, including ankle clonus and the Babinski reflex. There was no intention tremor or scanning speech. There was, however, a slight nystagmus and absence of the abdominal reflexes. I took one of my colleagues to see her who made a diagnosis of lateral sclerosis, which was also made by others. I, however, believe the case to be one of disseminated sclerosis. She gave a distinct history of abscesses of the roots of the teeth at the time of the onset and more or less trouble of this kind since, and at present has a number of old roots in her mouth. I believe there is a definite relation between the tooth trouble and her nervous phenomena. The picture at the beginning, however, was that of hysteria, and now the signs of lateral sclerosis predominate.

DR. ANDREW H. WOODS, Canton, China: It has been repeatedly pointed out during the past ten years that syphilis of the cerebrospinal system produces, at times, multiple, millet-sized sclerotic lesions which are in some cases with difficulty distinguished microscopically from the lesions of "disseminated sclerosis." The accompanying meningomyelitis in syphilitic disease is an important diagnostic point. There is, however, no reason to consider the syphilitic virus as the cause of "disseminated sclerosis." The distribution of the sclerotic lesions, both in these cases of syphilis and in ordinary "disseminated sclerosis," points to the blood lymph system as the avenue of approach of the causative agent. It almost certainly does not enter through the pia. The appearance of the pia-arachnoid in syphilitic cases is consistent with what we would expect from its protective function. The sections show round-cell infiltration, often intense. Inflammation may spread by contiguity to a thin segment immediately behind the membrane. The arterioles that enter the cord from the arteries of the pia are interfered with. The whole appearance is that the pia is keeping the irritant away from the underlying nervous tissues. The function of the cerebrospinal membranes and fluids is not nutritive. It is mechanical—lubricant and protective. The fluid is a hydraulic buffer for the cord which is suspended in it. The pia is not meant to absorb and transfer substance into the cord, but it is a barrier to keep things out. Hence, if organisms are acting within the tracts and gray matter of the cord and brain, we would antecedently expect that chemical agents injected into the intramembranous space would fail to penetrate the cord and act on those organisms.

DR. E. D. FISHER, New York: The subject of the frequency of multiple sclerosis was taken up in the New York Neurological Society some years ago, and the number of cases reported was very small. After that, as Dr. Sachs said, we began to study the symptoms more carefully and found more cases, but I think that then some cases were included which were not multiple sclerosis. The differential diagnosis between multiple sclerosis and hysteria is often difficult to make. Many apparently hysterial cases turn out to be multiple sclerosis. In London, in 1913, at the International Congress, many cases were presented at the Hospital for Paralytics and Epileptics. I think it was asserted that it was one of the most common diseases of the nervous system. As to the etiology, it may be of toxic origin, a disseminated myelitis. This differs from a primary degenerative disease. When we come to examine conditions in the cord and brain we find degeneration, but the peculiar characteristic of the primary disease is that the degeneration does not descend, as in myelitis. Where we have a localized sclerosis it is permanent and there is no such thing as a cure. No treatment will affect the sclerosed tissue and no new formation is possible, so far as we know. All that we can do is to alleviate some of the symptoms. I should not place my diagnosis on any two symptoms. It is a general picture and cannot be diagnosed by one or two signs. The prognosis is unfavorable and the disease is incurable.

DR. L. M. CRAFTS, Minneapolis: I think there is as much multiple sclerorsis in Pittsburgh as in any other city. Dr. Sachs says it is as fully recognized now in the United States as abroad. If he means by the United States, New York, possibly so. I was asked by Dr. Bramell why our observers were not reporting more multiple sclerosis. In Europe it is considered the most common form of organic nervous disease. It is a matter of closer observation. It is well not to make a diagnosis on one symptom alone, but with two characteristic symptoms, one referring to the cord and the other to the brain, one can make a diagnosis. In reference to the differential diagnosis from hysteria, that is at times difficult. One case I considered hysteria until I found Babinski's sign, which is never found in hysteria. One speaker mentioned astereognosis. I had two or three cases with astereognosis. In regard to the teeth and tonsils, there were a number of my patients with this coincidence. I had one case resembling amyotrophic sclerosis in a man of 69 who got out of his buggy after a long drive and found he could not walk. Dr. Fisher spoke of it as myelitis; it is agliosis. For treatment I have used thiosinamin sodium salicylate (fibrolysin), and there have been distinct remissions; but these may occur spontaneously. The case must be watched for long periods of time. The neurologist is the one who should be consulted. I think the Charcot picture should be revised. Scanning speech is not typical. There are many variations as typical as the Charcot type.

The First Infant Welfare Work.—In France, about twenty years ago, 1892, Dr. Budin stated a movement of paramount importance for France—I may say, for the world. He observed that physicians took care of the mother, but let the infant child take care of itself. The result was an infant mortality so great that between a man of 90 and a child of 1 day, the chance of living one week was in favor of the man of 90. In many parts of the country, out of two children, one was sure to die; in the more thickly populated industrial quarters in certain cities out of three children, two were sure to die. Dr. Budin thought it was necessary first to learn and secondly to teach; thus he came to establish his "Consultations for Nurslings," which have done wonders. Mothers come with their babies every week. The children are examined and the mothers are instructed how to rear their offspring to strong, healthy men and women, and produce citizens to enjoy a useful life. He especially taught that children were meant to be nursed by their own mothers, and that the use of the best cow's milk or of a most scientifically prepared mixture could not compare with the mother's milk.—*Jules Jusserand. Some Checks to Infant Mortality. Trans. American Association for Study and Prevention of Infant Mortality. First Annual Meeting, 1910, p. 34.*

NOTES ON THE STANDARDIZATION AND ADMINISTRATION OF ANTIMENINGOCOCCIC SERUM*

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Now that wide and repeated experience here and abroad with reliable preparations of the antimeningococcic serum in the treatment of epidemic meningitis has resulted in a consensus of opinion favorable to its value, it is time to take up seriously the question of providing federal standardization in order that the public may be protected from poor and worthless preparations.

Unfortunately, as the distressing English experience of 1915, later retrieved when supplies of potent serum became available, showed, the commercial producer of the serum cannot be left to determine his own method of manufacture and his own standard of potency.

There has been misconception also as to the practicability of standardization, which needs to be removed by a statement of the essential facts of the case.

Undoubtedly, our minds have been clouded and our action impeded by the notion, which is only slowly giving way, that the only therapeutically active serums are those which are antitoxic in the strict sense, while the other class of antibacterial serums stands on an insecure therapeutic foundation. In the face of the convincing data available relative to the effects of the antimeningococcic serum and the growing favorable testimony to the value of the antipneumococcic serum Type I, this prejudice is being overcome.

The essential obstacle in each case—that of the antimeningococcic and antipneumococcic serum — arises from the circumstance that neither the meningococcus nor the pneumococcus is a consistent species, both being separable into more or less distinct type groups. As regards the pneumococcus, the practical case is simple and the whole matter of standardization is reducible to a formula, since up to the present the serum Type I alone is therapeutically effective, and no serum should be accepted as up to the standard which does not contain given quantities of antibodies for Type I pneumococcus.

While the case is not quite so simple for the meningococcus, it is by no means so complex as to defy ready solution. In one respect, the therapeutic possibilities of the antimeningococcic serum are far wider than serums for pneumococcus, since it can be made effective against all the meningococci causing epidemic meningitis.

Fortunately for our purpose, 80 per cent. or more of all the cases of epidemic meningitis are caused by two type strains or groups of the meningococcus, regular or normal and parameningococcus, and nearly the remaining 20 per cent. by two more strains not quite so definitely marked off biologically as the former or intermediate meningococcus A and B.[1] Hence, a potent serum may be prepared with, say, the four type cultures, which, if of sufficient titer, may be accepted as standard.

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* From the Laboratories of the Rockefeller Institute for Medical Research.

1. A comparative study might readily reveal that the four type groups here given correspond with the so-called Types I, II, III and IV of the English classification.

Any one familiar with the recent invaluable English experience which has been collected into a pamphlet issued by the British Medical Research Committee[2] will know that, by pursuing a course similar to the one just outlined, they have insured supplies of an efficient preparation of the antimeningococcic serum, whereas formerly, without this control, they were grievously disappointed in the action of the available product.

This procedure will, as stated, yield a valuable and reliable preparation. In following it, there is nothing to prevent a more conscientious or ambitious manufacturer improving further his particular brand of serum by adding to the selected type cultures examples of the variants from the types which are occasionally encountered. This practice should indeed be encouraged; but it should not permit any clouding of the essential issue, which is to produce a highly potent serum for the standard cultures of meningococcus.

It is my intention to define what would be a readily realizable and adequate standard of potency. But before doing this, I wish to describe a series of tests which were carried out very recently with commercial samples of the antimeningococcic serum and, coincidently, with three other samples prepared by departments of health and the Rockefeller Institute.

TESTS OF COMMERCIAL SERUMS

Several immunity reactions have been employed in testing the value of therapeutic serums. When applied to the antimeningococcic serum, they arrange themselves in the following order of specificity: (1) agglutination at 55 C.; (2) opsonization; (3) complement fixation; (4) anti-infectious power, and (5) antitoxic power. Gradually, agglutination of the type cultures of the meningococcus is displacing other and less indicative methods of standardization. Accurate clinical experience also is confirming this decision. We have made a series of observations, which extend now over two years, on the relation of agglutination to the therapeutic efficiency of the serum. Thus, we have tested the meningococci isolated from the cerebrospinal fluid against several so-called polyvalent samples of the serum; and we have noted that when the sample of serum failed to influence the course of the disease, agglutinating power was either absent or very low. Moreover, we have also noted that the replacement of the impotent preparation of serum with one carrying agglutinins for the culture in question would, as a rule, control the infection. A serum of proper standard should agglutinate the four type cultures mentioned in dilutions of from 1:400 to 1:1,000. The still more efficient serum may show agglutination for all the variants in dilution of from 1:200 to 1:500.

Five samples of antimeningococcic serum produced by the larger producers of biologic products were purchased in the open market. The dates for return on all the samples were 1918. Presumably, therefore, they were recent products. To them were added three other samples: two had been obtained not long before from departments of health, and the third was a recent sample of the Rockefeller Institute preparation. They were examined for physical properties and for agglutination against four type cultures. The results are given in the accompanying table. The dilutions of the serum were set up by letters so that

RESULTS OF AGGLUTINATION TESTS MADE WITH DIFFERENT ANTIMENINGOCOCCIC SERUMS*

Sample	Date for Return on Label	Origin	Appearance	Regular or Normal Meningococci												Parameningococcus												Intermediate Meningococci											
				Stock Culture No. 1								Stock Culture No. 7				Stock Culture No. 60												Stock Culture No. 10								Stock Culture No. 30			
				100	200	400	800	1600	3200	6400	Control	100	200	400	800	100	200	400	800	1000	1600	3200	6400	Control	100	200	400	800	1000	1600	3200	6400	Control	100	200	400	800	1000	1600	3200	6400	Control
A	7/22/18	Commercial	Cloudy, amber colored																																				
B	1/27/18	Noncommercial	Clear, colored straw																																				
C	11/ 2/18	Commercial	Clear, colored straw																																				
D	6/20/18	Commercial	Dark, opaque, thick consistence																																				
E	12/ 7/18	Commercial	Slightly cloudy, straw colored																																				
F	7/25/18	Commercial	Slightly cloudy, straw colored																																				
G	—	Rockefeller Institute	Clear, amber colored																																				
H	11/22/17	Noncommercial	Clear, straw colored																																				

* The agglutinations were conducted at 55 C. over night by the macroscopic method.

2. Bacteriological Studies in the Pathology and Preventive Control of Cerebrospinal Fever Among the Forces During 1915 and 1916, Special Report Series, No. 3, National Health Insurance, Medical Research Committee, London, 1917.

the worker carrying out the agglutination tests was not aware of the origin of the several samples.

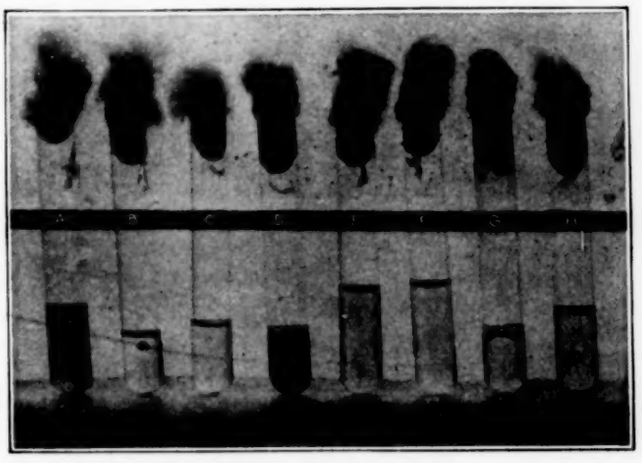
Moreover, the physical properties of certain samples were such as to make their employment by intraspinal injection, to say the least, dangerous. To explain this point, the accompanying illustration was made.

SUMMARY OF THE RESULTS OF THE TEST

Serum A (commercial) is slightly active against normal or regular culture No. 10 and sufficiently active against the parameningococcus culture No. 60. In other words, it is not sufficiently representative of the different type cultures to be suitable for therapeutic purposes. Moreover, the sample, while transparent, contains hemoglobin in excess and in an amount giving a red color to the serum. Severe reactions would follow its administration.

Serum B (board of health). The agglutinins are somewhat developed for the regular or normal meningococcus Nos. 1 and 7, well developed for the two irregular cultures Nos. 10 and 30, and for the parameningococcus. It is a useful product, but could be improved by the employment for immunization of larger quantities of the regular meningococcus cultures.

Serum C (commercial). Agglutinins are present in doubtful or small amounts for the regular meningococcus Nos. 1 and 7, and in somewhat larger quantity for the irregular culture No. 10 and the parameningococcus. This serum, which fulfils the requirements in physical condition, is of uniformly low titer and improperly balanced in type agglutinins. Its therapeutic efficiency is dubious.



Specimens of antimeningococcic serums illustrating variations in the physical condition of commercial products.

Serum D (commercial). The physical properties of this sample (as shown in the illustration) condemn it wholly. It consists of a dark, opaque, rather heavy liquid, which did not clarify on centrifugalization for twenty minutes at 3,500 speed. The preparation would undoubtedly give rise to severe, possibly to dangerous, reaction. And yet the product is marketed in dark amber glass so that the physician would not detect the color and suspect the danger. In order to be fair, it should be stated that another sample obtained directly from the New York office of the firm was straw colored and clear; but there is no excuse for putting out the former preparation. Had the container been clear glass, the sample would have been rejected; hence until clear white glass is used, it is advisable to pour out or inject about 1 c.c. of the serum into a test tube or other receptacle before administering it. Moreover, the agglutinins are present in low quantity except for irregular type culture No. 10. Aside from the physical properties of the one specimen, the preparation is unsatisfactory for therapeutic purposes.

Serum E (commercial). Agglutinins are present in adequate quantity for irregular culture No. 10 and for the parameningococcus culture. The quantity present for the regular meningococcus is minimal. The preparation is unsatisfactory for therapeutic purposes.

Serum F (commercial) represents the regular meningococcus and parameningococcus and the two irregular type cultures, but is improperly balanced. Taken as a whole, its agglutination titer is too long.

Serum G (Rockefeller Institute) represents adequately all the type cultures. A balanced serum which should fulfil therapeutic expectations.

Serum H (board of health) is a satisfactory product that should be therapeutically active.

COMMENT

A critical examination of the results of the tests exhibited in the table brings out points both interesting and practically of high importance.

The first thing that impresses one is the striking inferiority of the commercial as compared with the noncommercial products. There would appear to be very little excuse for this discrepancy. It is particularly true of the antimeningococcic serum that it is unsafe to reduce its preparation to mere routine. Second bleedings without further injections of cultures should not be made, and in no instance should the horses be bled for serum until a test bleeding has shown that agglutinins are present in adequate amount for the principal type cultures. The practice of mixing samples of serums of high and low titer to increase the volume collectable should never be practiced.

There is nothing involved in the preparation of a satisfactory serum that cannot be mastered in a properly organized commercial laboratory. But knowledge of the subject, conscientiousness and vigilance are demanded to obtain a product that will fulfil reasonable standard conditions and be therapeutically effective. It is to be trusted that merely by pointing out present deficiencies, rectification will be made; and it may also be hoped that the constituted federal authorities will establish and enforce a standard which is readily attainable and secure.

There is one point of technical interest in the table. Comparison of the agglutinability of regular or normal cultures Nos. 1 and 3 shows that one is more readily agglutinable than the other. This is a familiar phenomenon and one recognized in respect to many bacterial species. Its practical import in this connection is to the effect that in controlling the agglutination titer, reliance is not to be placed merely on a highly agglutinable culture.

There is no difficulty involved in this procedure, since it will practically never happen, and indeed it should not be permitted to conduct the immunization with a single regular or a single parameningococcus culture. Several of each, together with the representatives of the intermediate types, should properly be employed for injection.

It will be sufficient and a great gain to have progressed so far. As already indicated, a still more perfect serum product can be turned out by paying constant attention to the rarer variants and introducing them into the scheme of immunization, controlling their effects also by agglutination tests. But this refinement is one not to be introduced into the plan of standardization.

STANDARDIZATION

The next question relates to a practical standard for the serum. It should include two requirements. The first should define the physical qualities of the product which are acceptable. This definition should

include absence of more than a trace of hemoglobin, color of straw yellow to amber, perfect clearness, or if slightly turbid, clearing on standing for twelve hours. As regards the preservative, tricresol is to be preferred, and the strength should not exceed 0.35 per cent. and may safely be reduced to 0.2 per cent., provided due care is exercised in collecting and bottling the serum.

Next, the employment of dark glass containers should be prohibited. The container, whether bottle or syringe, should be of clear white glass, and the labels arranged so as to permit of inspection of the contents from without. The containers should be wrapped in blue paper or otherwise enclosed so as to exclude the actinic rays of light.

Finally, the agglutination titer for each of the four type cultures should be from 1:400 to 1:1,000, as determined by the macroscopic method after incubation at 55 C. for sixteen hours (over night).

There should perhaps be added one more comment. With the assembling of large numbers of recruits, it is quite probable that epidemic meningitis may become more widely and numerously prevalent in this country. In the interests, therefore, of the military and civil populations, the supplies of the antimeningococcic serum now so generally employed in treatment should be vigorously controlled.

ADMINISTRATION

As the result of a somewhat extensive experience with the clinical administration of the serum, I wish to direct attention to a few points of value. Whether or not the serum is to be effective depends in the first instance on its content in immunity bodies; but it depends also on the dosage, early administration and the frequency of repetition. The question of dosage has been considered in Dr. Flexner's[3] recent paper and need not be discussed here. It remains to be said that while the temperature remains high and meningococci are still present in the cerebrospinal fluid, injections every twelve hours, except in very young babies, should be resorted to unless clinical indications to the contrary exist. The next interval between injections should be twenty-four hours, then forty-eight hours. Subsidence of high temperature, clearing of cerebrospinal fluid with disappearance of the meningococcus, and general improvement in the condition of the patient, are the indexes for moderating the energy of the treatment.

The position of the patient is of moment. In order to distribute the serum over the surface of the brain and into the lateral ventricles after the intraspinal injection, the foot of the bed should be raised from 8 to 12 inches and kept so for six hours if possible. Sometimes the headache resulting from this position may make it expedient to return the bed to the normal position. At the end of six hours, the foot of the bed is lowered to its original position, and the other end raised until the time for the next lumbar puncture. During this time, the turbid fluid or pus is collected in the lower part of the spinal canal to be drawn off at the next puncture.

In addition to treating all cases by intraspinal injection of the serum, it is advisable to administer one or more doses intravenously in fulminant or very severe cases, or cases in which there are numerous skin hemorrhages. The quantity thus injected should be from 50 to 100 c.c., depending on the age of the patient and the severity of the infection. The usual precautions for guarding against anaphylactic reaction should of course be taken. Intravenous injection has been employed also to supplement the intraspinal ones in cases of less severity coming late under the serum treatment. Whether this is a real advantage cannot be stated positvely; in some instances, it appeared to be beneficial. Obviously the chances of recrudescence and of blocking off of the ventricles will be lessened.

Ventricular puncture and injection of serum into both lateral ventricles should not be delayed when symptoms of cranial involvement remain after the spinal fluid is almost normal.

3. Flexner, S.: Mode of Infection, Means of Prevention, and Specific Treatment of Epidemic Meningitis, THE JOURNAL A. M. A., Aug. 25, 1917, p. 639; Sept. 1, 1917, p. 721; Sept. 8, 1917, p. 817.

RETAINING THE FLOOR OF THE ORBIT IN RESECTION OF THE SUPERIOR MAXILLA

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CHICAGO

Surgeons are familiar with the fact that the removal of the superior maxilla does not leave the patient in such a state of repellent deformity as one would expect. Furthermore, functions of the parts

Fig. 1.—The wire saw carried through from the nose into the orbit.

remaining are not so very much disturbed. The dentist can be of the greatest aid on the oral side, and the arts of the rhinologist remove or alleviate many of the difficulties that arise within the nasopharyngeal cavity.

But Hans Bode[1] wisely remarks, "It is very important that the eye shall rest on a substantial support and that the oral and nasal cavities shall be separated from one another."

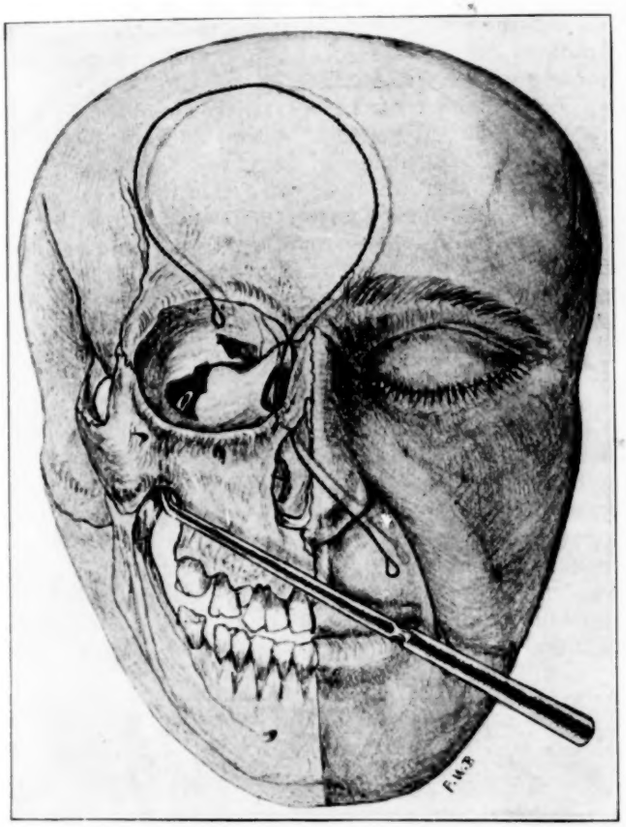

Fig. 2.—The saw carried across the orbit to make its exit through the sphenomaxillary tissue into the zygomatic fossa.

As early as 1859, Langenbeck preserved the periosteum of the orbit, and Bode tells us that his literary studies reveal the fact that Heine, Jacobs, Israel, Peyrat, Jallaguier, Koenig and Kuester have operated in this way. Koenig, Jr.,[2] in 1900, provided support for the eye by splitting from the outer part of the temporal muscle a flap one and a half finger-breadths long which contained the coronoid process and the anterior edge of the submaxillary border, together with the muscle insertions. This substantial flap he applied below the globe in order to supply a firm base of resistance where the bone had been removed. Riese obtained a good result with the method.

Another ingenious substitute for the lost support was provided by Schoenstaedt,[3] who used the transplanted middle turbinate as a flap.

Bode remarks that, since most of the operations of resection of the superior maxilla are undertaken for the extirpation of malignant growths, it is frequently not feasible to leave the periosteum. With this statement I am entirely in harmony. Kuhn,[4] who worked with the advice of Rehn and who used the material of the latter's clinic, strongly recommends more radical operations than have been, as a rule, performed.

I have been appalled, when first viewing the cavity left after resection, at the inroads made by malignant disease in the structures contiguous to the part removed. But I can substantiate the statements of Kuhn that much can be done to prevent recurrence by extensive removal of invaded tissues about the base of the skull, the soft palate and the neighboring accessory cavities.

It is with the conflicting necessities in mind—on the one hand that the globe shall be substantially supported, and on the other hand that the malignant disease shall be thoroughly extirpated—that this paper is presented. Yet it is to be remembered that there are not a few cases of superior maxillary cancer which begin at points remote from the orbit, and that some resections are made for nonmalignant disease.

Since the floor of the orbit is very thin and the lower border of the orbit is not massive, the retention of this tissue may frequently be practicable with the aid of the method to be presently described.

Curiously enough, but few advances have been made in the actual technic of these resections in many years. Kuhn's[5] anesthesia by tracheal tubage and preliminary ligation of the external carotid artery are most desirable advances in management.

There are many incisions from which to choose in laying bare the structures to be removed. Any incision through the soft parts may be used. I prefer the one which vertically divides the upper lip in the median line, passes around the ala of the nose, runs then toward the inner canthus of the eye, and, before reaching that point, curves along the lower orbital edge to the end rather far out toward or on the malar bone. This flap is first turned out and held wrapped in gauze. The hard and soft palates are divided in

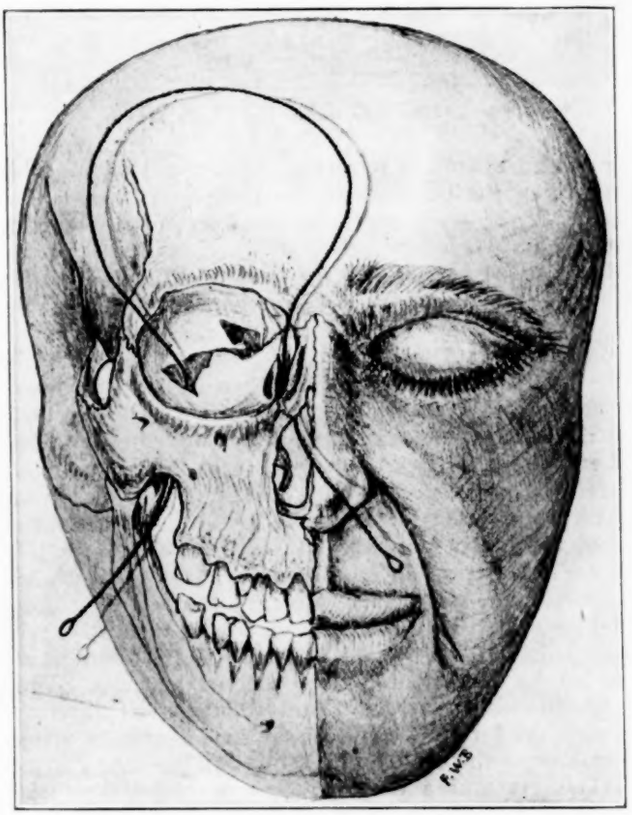

Fig. 3.—The wire saw in position, but not drawn taut.

1. Bode, Hans: Beitr. z. klin. Chir. (Bruns'), **74.**
2. Koenig, F., Jr.: Arch. f. klin. Chir., **61,** No. 3.
3. Schoenstaedt: Ztschr. f. ärztl. Fortbild., 1908, No. 14.
4. Kuhn, F.: Zentralbl. f. Chir., 1913.
5. Kuhn, F.: Zentralbl. f. Chir., 1901.

the usual way, with the chisel or with the Gigli saw.

Then the separation of the floor and the margin of the orbit from the body of the bone is effected as follows:

Fig. 4.—The approximate line of the saw-cut.

With a spatulous retractor, the contents of the orbit, including the periosteum, are held up, after the soft parts have been separated carefully from the bony edge and floor of the orbit. Now an ordinary grooved director is bent into a large hook and passed into the orbital cavity. With its point the anterior part of the sphenomaxillary fissure is found and the point is passed out into the zygomatic fossa, where it can be first felt by the finger-tip and then caught in a heavy silk loop. Withdrawal of the instrument brings with it the loop by the aid of which the end of a light, and therefore easily flexible, Gigli saw is carried through.

Next the grooved director is passed from within the orbit toward the median side, to the lacrimal groove and, with slight pressure, caused to perforate the thin bone and enter the nasal cavity. By being pushed further on, its point may be made to emerge around the bony margin of the nasal cavity. There it is again grasped by a loop of heavy silk, which is withdrawn as before through the wound below the globe. This loop of silk, removed from the grooved director, grasps the loop of the Gigli saw and carries it across the floor of the orbit and out through the nose.

This gives us a wire saw passing under the malar bone to the anterior part of the sphenomaxillary fissure, thence traversing the cavity of the orbit to the lacrimal groove, entering the nose through a perforation of the shell-like bone and emerging from the bony nasal framework.

The operator is now to attach the handles of the saw, and make his cut with the usual precautions of keeping the saw at work as nearly in a straight line as possible, and making the excursion of the handles as great as he can, in order to diminish to the utmost the danger of breaking the saw.

It will be seen that this maneuver accomplishes at once three of the classical steps of the operation: It divides the malar bone, separates the superior maxilla from its orbital connections, and transects the nasal process of the upper-jaw bone.

The remainder of the operation is conducted in the way described in the textbooks of surgery.

The drawings, made by Dr. F. W. Beilstein, show the steps of the maneuver in reverse order.

I have had one opportunity to carry out this procedure in the case of a man, aged 75, suffering from carcinoma of the superior maxilla, the disease beginning in the antrum of Highmore just above the left canine tooth. After preliminary extirpation of the regional glands in the neck and ligation of the external carotid artery, the usual flap was made and the procedure which has been described was carried out.

This experience taught that the grooved director chosen should be large and easily bent to any curve, and that the silk should be braided and very heavy to avoid breaking. No difficulty was experienced in raising the contents of the orbit and working beneath them. Sharp bleeding occurred when instrumentation was carried out through the nose. But this ceased spontaneously after a few minutes. The total amount of blood lost was not great. With the greatest regret

Fig. 5.—The saw-cut almost complete.

it must be recorded that the patient died on the table before the sutures had been applied, but after the extirpation had been completed. The pulse continued beating at the wrist long after respiration had ceased, making it evident that ether poisoning was the cause

of death. The feasibility and practicability of the operation were proved.

I recommend this modification of the usual procedure, when the floor of the orbit has not been

Fig. 6.—The exposure of the orbital floor and the entrance to the nose.

invaded by disease, in order that the globe of the eye shall retain its full support, that the palpebral muscles shall have their attachments unimpaired, and that the disfigurement of the face by collapse shall be maintained at the minimum of necessity.

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FRACTURES *

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In presenting this paper I cannot include all fractures, nor all of the details of any one fracture. I have selected certain conventional methods usually employed in every day practice, and I shall attempt to show that those methods are defective, and with each defect I shall submit my reasons for calling them defective, in each incident supplying what I consider a correction of the defective method. In other words, I believe there are sound logical reasons that explain bad results in treating fractures, and I also believe that better and more consistent results will follow better methods. The better methods, at least, are logical, they are consistent with the unalterable laws of nature, and they are approved by physicists and mechanical engineers.

By directing my first attack on the popular use of the weight and pulley in treating broken femurs, I shall bring to light the absurdity involved in at least one conventional method. However, if any one can defend this traditional usage, we shall all be glad to hear from him.

Back in the dark ages and probably before that time, and at the present time, bone setters searched for a consistent force to hold broken bones in a constant normal position. Hence they selected the constant force of gravity, knowing that bones would unite in the position in which they were held. They did not stop to consider that they were using the force of gravity, first, on the patient's body, where it acted as a fixation force, and secondly, on his leg, where it acted as an active kinetic force to oppose the most varied of all opposing influences which are to be found in the varied and irregular contractions of muscle tissue. Muscle tissue, if prodded with a sharp piece of bone, may exhibit spastic contractions, a tremor, relaxation or irregular contractions, all of which are to be opposed and balanced between the active force of gravity applied through the weight and pulley, and the fixation force of gravity applied to the body of the patient as it holds him down on his bed.

It is a difficult matter to convince any physicist that there is any balance or constancy in a formula that uses gravity as a fixation force on one end, and the active and acting force of gravity on the other end, while between the two there is present the unconstant and varying opposition of muscle contractures. Hence, in defending the use of the weight and pulley, I propose not to drift into a dissertation on the wonderful results following its employment, but rather to adhere to the fixed basic mechanical principle involved. Those wonderful results obtained can be logically explained and obtained without the weight

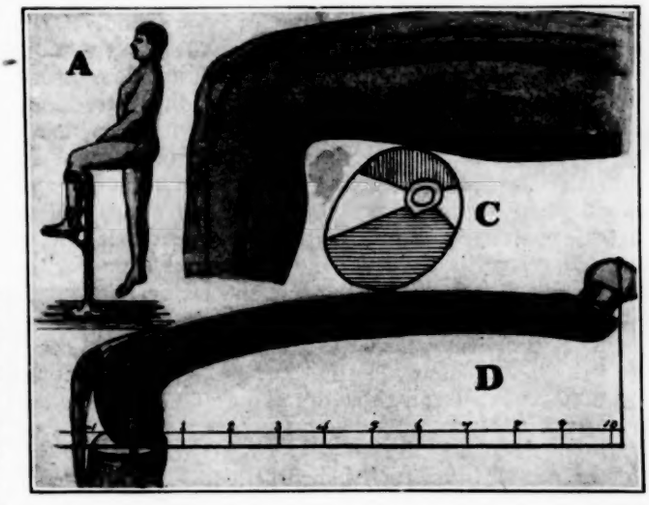


Fig. 1.—Mechanical principles involved in correcting a fracture of the femur: *A*, the powerful leverage of the femur in lifting the body; *B*, thigh muscles which cause direct traction; *C*, cross-section of the thigh illustrating groups of muscles concerned in reducing fracture of femur; *D*, the femur pictured as a scale beam.

and pulley. What we are really striving for is the hope of putting our specialty on an unassailable basis, at least from a mechanical point of view, and I desire to see eliminated all possible guesswork and bunglesome misuse of mechanical principles in this age of sound mechanics. If I am wrong in the hope or in my mechanical claims, we should all know it.

* Read before the Section on Orthopedic Surgery at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

* Because of lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints. A copy of the latter will be sent by the author on receipt of a stamped addressed envelope.

Believing that there is no constancy, balance or logic in the principle of the weight and pulley, I will, before suggesting some substitute, take up one more absurd item in regard to the amount of the weight used with the pulley.

Figure 1 *A* represents a young man with his leg fastened securely to an iron frame. Without unusual effort he lifts the entire weight of his body directly from the floor. Suppose he weighs 225 or 250 pounds; then, while lifted clear of the floor, the only part of his body not lifted by the extensor muscle

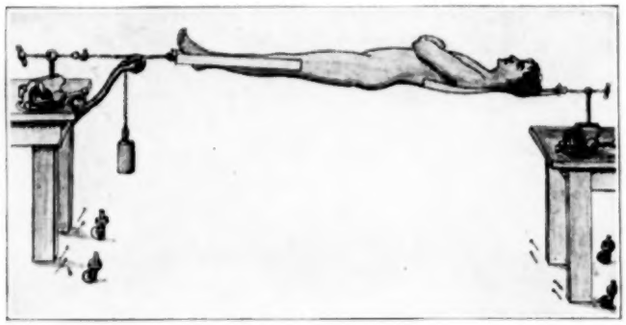


Fig. 3.—The mechanical difference between fixation energy and the weight and pulley. Fixation of support is secured by nailing the two tables to the floor instead of having them mobile on the casters, and thus the patient's body may be fixed as desired.

would be his leg and foot which rest on the steel frames. In other words, the rectus muscle through the agency of the femur as a lever is lifting a total of 200 pounds.

Figure 1 *D* represents the femur laid off as a scale beam; — 1 represents the length beyond the fulcrum *O*, while more than 10 units extend back to the long arm of the lever. Thus when he lifts his body, 10×200 pounds represents the strain or traction of the rectus muscle. I believe no one could tolerate the traction of 1 ton during the time of bone union.

In Figure 1 *C* it will be noted that the cross-section of the thigh at point *B* represents the total amount of the thigh muscles capable of making direct traction. The total traction released for activity in the event of a fractured femur would amount to several tons. It will be observed that the segment in the cross-section indicated by vertical lines represents the rectus. The lateral unstriated segments plus the lower, laterally striated segments exceed the rectus by five or six to one. This being the case, what special or particular function would a 10, or 50, or 100 pound weight perform in the event that the patient sneezed or contracted his thigh muscles, or during a spasmodic contraction while sleeping or dreaming? We all know that some muscles tire out and others never seem to offer much resistance. We also know the spastic type of muscles that resist, such as a finger in writers' cramp.

If the formula or principle of the weight and pulley is wrong, and if the weight is insignificant, then it behooves us to employ correct mechanical principles. The idea is constant normal position. We must use fixation energy for fixation purposes.

Figure 3 represents the mechanical difference between fixation energy and the weight and pulley. The weight and pulley would allow the body of the patient to sag. The same is true if the traction screws were employed, provided the two tables were mounted on rollers. But, if fixation energy should be applied (by first nailing the tables in place on the floor), then the traction screws would drag the patient's body to a straight horizontal line like a tight rope, if such unpardonable traction were used. By placing the patient in bed the traction screws merely guarantee a fixed distance between themselves, any part of which fixed distance may be occupied by the patient. If steel pins above and below the fracture are held at a fixed distance apart, they serve as fixation energy. A Lane plate serves as fixation energy. If the square ends of bone rest against each other, or if the bony spicules and their retaining notches rest against each other, there is fixation energy. But, if the patient disturbs such contact by using the bed pan, or by coughing or other commotion, then the bones are apt to be displaced and must be reduced to opposing position again. It is easy to understand how a good result might be obtained with the projecting spicules and notches of bone, even if a trifling weight was or was not employed. If the projecting spicules of bones caught and hung in muscle tissue, a fair result might occur in spite of a trifling weight and pulley.

In regard to the reduction of the shaft of the femur, there are cases in which screw traction will draw the fragments down past each other and permit the ragged ends of bone to come into their proper places. There are other cases, and plenty of them, in which the hamstrings and gastrocnemius and soleus muscles prevent reduction, provided the knee joint is extended

Figure 4 *A* represents the knee flexed and relaxed, while *B* represents the knee extended with the posterior muscles tense. Any one who will extend the knee joint will find the hamstrings tight. They will surely be loose if the knee joint is flexed. Now the so-called transverse fractures are not like the sawed edges of a bone. If they were, the bones would go into place with the knee extended. But the transverse fracture is transverse roughly with bony spicules and notches

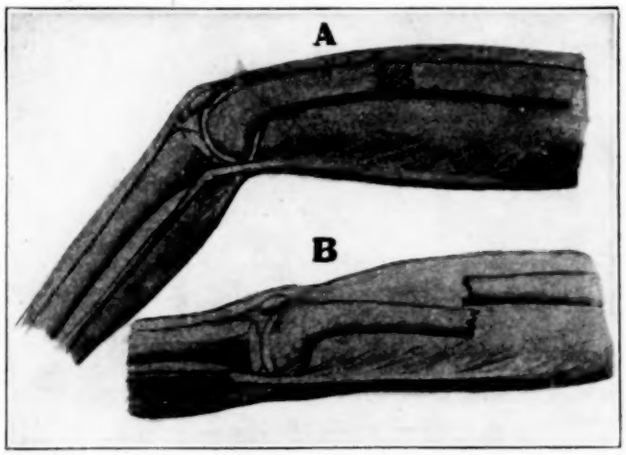


Fig. 4.—Unlocking the thigh so as to approximate the fractured ends: *A*, the knee joint flexed and muscles relaxed with bone fragments in perfect apposition; *B*, the leg extended and the fragments displaced.

left. Hence, in order to get the bones in line, the muscles must provide the requisite length for the rough areas to pass each other. But if the muscles are tight, when the knee is extended, they will not stretch enough to permit the rough ends to pass each other; consequently, the thigh must be muscularly unlocked by flexing the knee. Under knee flexion the bones easily go into place and, in these cases, will lock in place if the knee joint is again extended. This

matter of unlocking the thigh is so helpful that it is strange it could have escaped mention in our textbooks.

There is another item involving the use or misuse of good mechanics that should be mentioned. In the treatment of hip joint disease and in manipulation of certain fractures and dislocations, a line of traction parallel with the neck of the femur is sought. It is

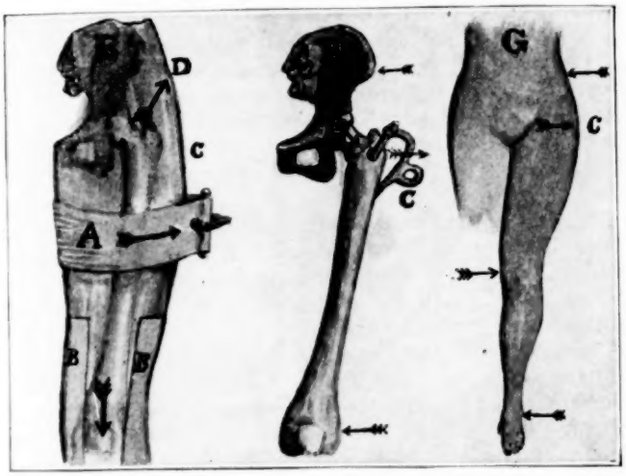


Fig. 5.—Traction to be applied in a line parallel with the neck of the femur: *A*, band applying lateral traction; *B*, adhesive strips making downward and outward traction in line with the neck of the femur pointing from the acetabulum to *C*; arrow pointing to *D*, actual result of such traction; *F*, proper position maintained by downward and lateral traction as indicated by arrows; *G*, points of pressure at which desired traction is secured.

regularly attempted, as shown in Figure 5 *E*. Adhesive plasters, *B B*, on the leg have traction applied to them, while a band, *A*, is passed around the thigh and is pulled laterally. The composite result of the traction on *A* and *B* is supposed to result in a downward and outward traction in line with or parallel to the neck of the femur pointing from the acetabulum to *C*. The actual result, however, is almost directly at right angles, as indicated by the arrow pointing toward *D*.

The desired traction can be accomplished by following the unusual suggestion indicated in Figure 5 *F*, or to a limited degree by following the lines of pressure indicated by the arrows in *G*.

Figure 6 indicates one of the important triangles of the thigh in regard to which I wrote quite extensively twenty years ago. Two sides of the triangle are bone, while the third is muscle. If one side or one angle of a triangle is changed, the entire triangle is altered. Thus, if the side *A–C* is bent inward, the rest of the triangle must change. It does change, and as the femur is dislocated or fractured and free to move and the rest of the triangle is intact, the shaft or line *C–B* will travel upward or outward or in the two directions simultaneously.

Figure 7 is interesting in showing how a little pressure on the gracilis and adductors will become a tremendous upward pressure. If in *B* there is a 1,000 pound weight suspended by a rope, a very slight pressure at the middle of the rope will bend it, and if bent at all the weight has been lifted, although it may have been lifted only a fraction of an inch; yet it is true that 1,000 pounds has been lifted.

C represents the same state of affairs, except that the 1,000 pounds are secured to the top of a rod, while the rope is secured to the bottom of the rod. A pressure of a few pounds, or even a few ounces, against the middle of the rope will produce a pressure of a thousand pounds upward. This illustrates how we may create tremendous destructive pressure in the head of the femur and acetabulum by applying lateral pressure or traction to the gracilis or adductor muscles.

D represents, in all fairness, the increased pressure required to lift the same weight by applying more pressure or traction when the rope makes an angle of about 90 degrees. But the gracilis and the adductors make no such angle.

Figure 8 represents various positions employed in using the weight and pulley method.

In considering the basic mechanical principles appropriate to the treatment of fractured femurs, the ingenuity of the physician will be greatly improved if he does not consider this or that transverse or spiral or compound complicated fracture, but pictures constantly in his mind how he would treat a patient who had the middle third of the shaft entirely shattered and disconnected. By keeping this picture in mind, the physician will be stimulated to consider basic principles. If they are appropriate to a shattered femur they might be appropriate to a more simple form of fracture, since after all the thigh is merely an eccentric muscle tube with a bone filling its lumen. Of course a shattered or simple fracture of the neck of the femur are treated alike, as fractures of the neck of the femur are the easiest of all fractures to treat without deformity or shortness. The rules of fixation energy for fixation purposes are borne out here as elsewhere, and I know of no case of nonunion or "ligamentous union" which is genuinely nonunion to have resulted from this method of treatment at any age. In very old people of 80 or 90 years the bones unite. These patients may die with or without any treatment, but I believe their chances are better if no analgesic or any anesthetic is used at any time during

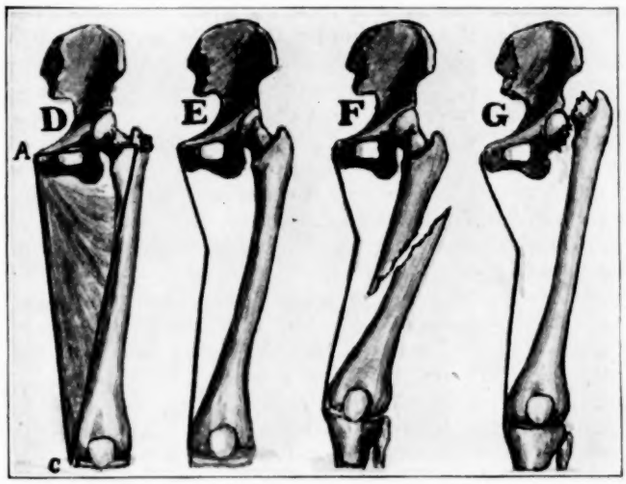


Fig. 6.—Triangles, two sides bone and one side muscle; if line *A-C* (muscle side) is altered, bone shaft *C-B* will travel upward or outward, as shown in *E*, *F* and *G*.

the period between accident and recovery, and there is no occasion for using anesthesia or analgesics, as the treatment is not painful nor pain-inflicting, but is absolutely comforting from the moment it is begun. This, of course, is a statement to be substantiated by the physician's own patients when this method is adopted. The simplicity of the method is the feature most difficult of comprehension to the average practi-

tioner who employs it. An ordinary army stretcher with a traction screw or strap at each end and a hole in the canvas for the bed pan service is a simple, direct and efficient fracture splint. But the details are trivial; the essential features are the selection of appropriate mechanical principles.

Allied to fractures of the femur are fractures of the humerus. Here the principle of fixation energy

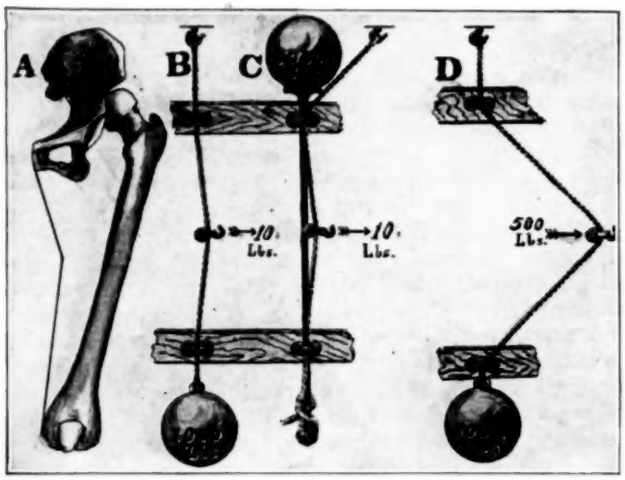


Fig. 7.—Illustrations of possible destructive pressure on the head of the femur and acetabulum by applying lateral pressure or traction to the gracilis or adductor muscles: *A*, displacement of the femoral head through improper traction or pressure; *B*, slight lateral traction in the center causing weight to rise; *C*, weight on top of rod raised by lateral traction; *D*, extreme traction required to lift the same weight to an angle of 90 degrees.

for fixation purposes is equally essential. Instead of using the tuberosity of the ischium as a superior fixation point, we use the muscles in front and behind the axillary space protecting the blood vessels and nerves from pressure. The inferior fixation area is the angle pad anterior to the elbow resting down on the forearm and back against the arm.

In Figure 9 a band under the wrist serves to hold the elbow in right angle position, affording a base for the angle pad. This type of splint is not new and untried, but has been in use by me for twenty-five years. The wire and adhesive plaster brace, as will be noted at *C*, is light, rigid and clean, permits free inspection at all times and is easily adjusted, is neither expensive nor difficult to construct, and is efficient in affording constant diastasis and maintaining constant normal length of humerus. The fixation area is supplied by the superior axillary base and the lower base on the forearm close to the arm as shown in Figure 9 *C*. Likewise, *B* represents the axillary sling, crutch or bandage showing the pectoralis muscles in front and the latissimus dorsi behind, against which the padded sling rests protecting the axillary blood vessels and nerves. *A* is a transverse section through the arm and chest showing that the padded axillary sling should not compress the blood vessels or nerves of the arm.

Figure 10 shows in series the construction of the angle or elbow pad. I have frequently made them out of empty ether cans. Have the nurse hold the can over a gas flame until the solder melts, quickly throw the can on the tile floor to prevent its resoldering itself, then cut and bend it, stick it together with adhesive plaster and pad it, and apply it with bandages that do not encompass the arm or forearm, but attach to the brace as shown in the drawing.

Fractures of both bones of the forearm seem to give considerable trouble for a variety of reasons. These bones are provided not only with muscles paralleling them capable of long axis compression, but also diagonal pronators and supinators, and one other not to be forgotten is the rotator. The last and universally overlooked condition is the fascia. The fascia is inelastic, built to fit over a forearm containing only two bones. If the bones are broken obliquely and override each other, the inelastic fascia is called on to provide space for three or four bones instead of two.

Figure 11 *A* represents normal cross-section of the forearm, showing the interosseus membrane in a straight line. *B* represents fractured bones overriding and taxing the inelastic fascia to its full capacity. The interosseus membrane no longer occupies a straight line position.

A frequently used method of treatment consists, first, of traction, and, second, the application of a padded separator to be crowded down between the bones, as shown at *F*. If the fascia is loose and flabby, this scheme might be feasible; but after fracture there is usually sufficient swelling to fill the fascia to its capacity. If already tense, then any pressure will draw the bones closer together instead of separating them. This is shown at *C* and *D*. It is a well known and established fact that a circle surrounds the greatest area of any geometric figure for a given fixed length of peripheral line. Consequently, if the circle is compressed at any point, the compression is equal for all parts and the compression is extended to the contents of the circle. Therefore the intervening separation pad becomes an interosseus approximator, and obviously should not be used.

The question of using fixation energy in this case becomes complicated. Some experienced operators use Lane plates, although Lane informs us that they are not as good for arms and forearms as they are for legs and thighs. I dare say many physicians have had good and bad results with them.

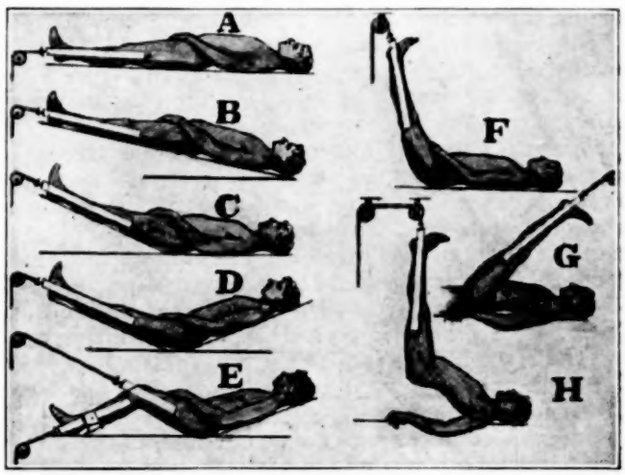


Fig. 8.—Various positions in which the patient may be placed when traction is made with weight and pulley.

Figure 12 shows a Lane plate installed. It will be noted that only one or two turns of thread are confined to the durable, hard shaft of the bone, while six or seven turns of the thread extend into the open space of the canal of the bone. Of course, no efficiency accompanies this unengaged portion of the screw. Furthermore, the round hole that fits so

snugly the newly installed screw becomes oval or egg-shaped in a week or two, and then even the upper thread or two become as useless as those sticking down into the marrow or open canal.

Figure 13 represents the bone gimlet with its low melting alloy handle compared with the screw. It will be noted that the screw at best has only one-eighth to three-sixteenths inch bearing, while the pin

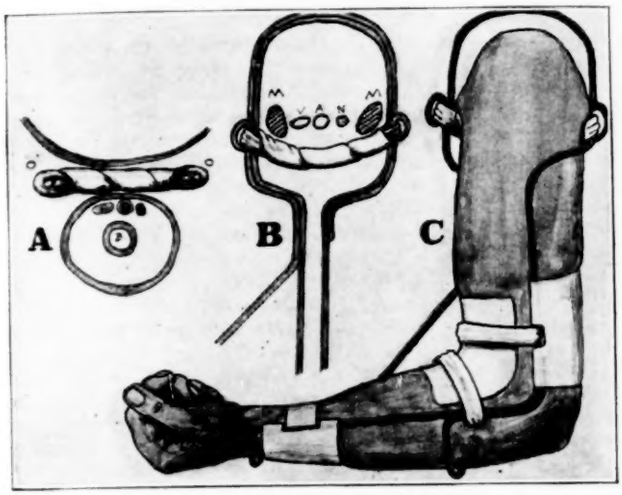


Fig. 9.—The principle of fixation energy as applied to fractures of the humerus: *A*, cross section of the arm illustrating the relationship of vessels and nerves to the humerus and showing the correct position of the axillary sling to prevent compression of the blood vessels, and nerves; *B*, relation of important structures to the padded axillary sling; *C*, axillary sling and wire brace applied so as to hold the humerus in the correct position.

goes clear through the bone, engaging both sides. Now the little round holes for the pins become just as oval as they do for the screws. The difference is that the pins transfix the entire forearm, and at all times provide external control over internal conditions. If the pins become loose, the slack can be taken up outside. It cannot be taken up with a Lane plate, but the plate can slough out while the pins remain in position. In the event that the Lane plates succeed in staying in, they remain in forever; but the pins are removed after bone union, and the forearm is not half human and half hardware. Another advantage of the pin is the long leverage obtained from passing from one side of the bone to the other. The strain is divided and the holes remain round longer. The details concerning lack of infection and freedom from pain have been covered in previous papers, although they are open for discussion at any time.

The last fixation device that I shall take up is the wire stabilizer shown in Figure 14. In this diagram there are presented four or five technically different types of wire stabilizers attached internally to the broken bone and externally to the straight edge, which straight edge is usually made of the low melting alloy. In badly shattered bones these stabilizers and external straight edges are indispensable. I prefer the plain flat metal to the tube instruments. Sterilization is more certain and easier to accomplish. This device forms the simplest type of stabilizer.

CONCLUSIONS

I trust that I have been both fair and successful in presenting just a few of the many defects in treating fractures, and also successful in presenting efficient and unquestionably sound remedies for the methods I have referred to as inappropriate or deficient.

In the department of mechanical surgery, the surgeon's methods will be judged to some extent by their mechanical soundness. Consequently, fractures and dislocations and other cases involving mechanical problems will be referred to that department which is the most efficient and most capable of treating them. If it can be shown that we can best treat these patients, they will not be classed as general surgical cases.

1899 North Illinois Street.

ABSTRACT OF DISCUSSION

DR. JEFFERSON D. GRIFFITH, Kansas City, Mo.: Fractures of the long bones, especially the fractures of both bones of the forearm, are difficult to treat and get a perfect result. One may get a functional result with the bones overlapping, and a useful arm, but the thing is, How can we get a perfect result? We can all use this apparatus of Dr. Allen's. I think very well of it. The claim made of reducing and having an aseptic condition is all right.

Some years ago Dr. Parkhill of Denver employed the same principle, with screws and clamps which he connected afterward. They could be put on without any trouble at all with the patient under an anesthetic. I have used his device, and I could succeed in maintaining reduction very well with it after I got it on. But it required the use of his complete outfit, which you must have on hand before you commence reducing the fracture. After you have the pins through, by Dr. Allen's method, you have to use the fusion clamp to maintain the malleable metals in position. If this can be done easily, I like it. The Parkhill method was the same as that of Dr. Allen, except that it had the screws with it, with movable plates on both sides. I have his apparatus at home now and have used it in fractured femurs and forearms. I like Dr. Allen's method much better, I think, if I can find a way to get at it and do it easily.

DR. EDWIN W. RYERSON, Chicago: I should like to ask whether Dr. Allen has any difficulty with paralysis from the crutch under the arm in fractures of the humerus treated by his ingenious apparatus.

DR. JOSEPH E. ROOT, Hartford, Conn.: I wish to emphasize the value of a constant fixation, instead of the old method of

Fig. 10.—Method of construction of the angle or elbow pad from an ether can: *A*, ether can flattened out; *B*, ends cut ready for bending; *C*, ends curved; *D*, ends approximated to form an angle; *E*, adhesive strips fasten ends together; *F*, the can padded; *G*, arm straps placed in position; *H*, the elbow support applied.

using a weight and pulley, which are inconstant. We have in Connecticut a celebrated family of Swedes who are natural bonesetters. The best representative of this family once made this remark, which has always stuck with me, and has been my guide in my entire work with bone: "Doctor, if you put on a variable extension,"—he referred to the ordinary

weight and pulley—"you will have trouble. As long as you fight the muscles, they will fight you, and you will gain nothing but constant misery to the patient and a bad result." I have always worked on that principle. If you employ such an extension, you have a see-saw all the time. The pulley never lets up, and sets up a source of irritation to the muscles which cannot be overcome.

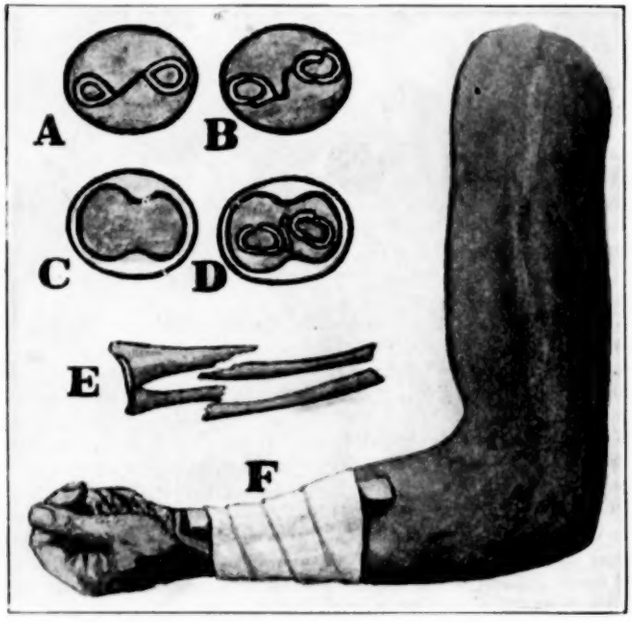


Fig. 11.—Importance of the interosseus membrane in the correct treatment of a fracture: *A*, normal straight position of the interosseus membrane; *B*, curving of the membrane due to overriding of fractured bones; *C* and *D*, external pressure causing faulty position of fracture, since it will tend to force the bones together; *E*, overriding in fractures of the forearm; *F*, commonly used padded separator, which should not be employed, as it applies undesirable compression.

I do not think it is just to criticize means to an end. Every man gets results by methods of his own; but so long as his results are good, he should stand by his own methods. The method of Dr. Allen is unique, and I can see some difficulties in its ordinary application.

Dr. John Ridlon, Chicago: It is true that the general surgeon and the general practitioner still use weight and pulley traction in the treatment of fractures, but I did not know that any orthopedic surgeon used weight and pulley traction now in any line of work. I have not used any variable traction for more than twenty years, and I hope that no orthopedic man is any longer doing it. The main point is not whether we shall use pins in this way or in Parkhill's way, or splints with fixed traction, or plaster-of-Paris. The meat is to put the fragments in place—in common parlance, to set the fracture; and I do not know any way by which one man can tell another that he knows that he has set any individual fracture. That is a personal question; and he either thinks he has set it or is in doubt whether he has set it or not. If we really set a fracture, we can hold it set by almost any fixation apparatus. I do not think that Dr. Allen has shown us how we can know with certainty that we have set any fracture.

Dr. Albert H. Freiberg, Cincinnati: I looked forward to hearing the paper with some anticipation, and after hearing it felt keen disappointment, because I have heard substantially the same principles enunciated and the same apparatus shown by Dr. Allen for the last three successive years. I had felt that this time I was going to come and hear, not simply that a broken bone was to be treated like a broken table leg and by the same mechanical principles, but that I should hear Dr. Allen tell what he has done and see him show it, which, after all, is the "milk in the coconut." I am still unaware, moreover, what this fusible metal consists of. Dr. Allen's method is ingenious, but whether it works out in practice is another matter; and I think that he owes it to us to show us that it does work out in practice by exhibiting tangible results.

Dr. Henry Keller, New York: I should like to ask Dr. Allen whether he is confining himself to the treatment of cases not amenable to simple methods of treatment in performing this operation, or whether he uses this method in every case. There is a social question involved in that. A good many patients, as soon as you tell them that there is to be an operation, will get frightened. In using this method, asepsis being of great importance, you have to take the patients to a hospital, whether you are dealing with fractures of the humerus or fractures of any other part. The general practitioner has something to say about this. When he calls in a consultant he does so because he wants the cooperation and advice of an expert. If you are going to advocate that every patient is to be treated with pins and must be taken to a hospital, that will simply keep the general practitioner from calling in a consultant and lead him to do the work himself, for fear that the patient will be taken away from him. A great deal of work has already been taken away from the general practitioner, and it is time that we look at things medical from his point of view. If, however, this operation is to be confined to cases that cannot be reduced by simple methods and held by ordinary immobilization, that is all right. After one has tried conservative methods and does not succeed, it is time to devise various other means of reducing the fracture and keeping it; but before that, there is no reason to open avenues of infection and also add burdens to the already overburdened and underpaid general practitioner.

Dr. Roland Hammond, Providence, R. I.: I am one of those orthopedic surgeons who are still using the weight and pulley in the treatment of fractures in the shaft of the femur and, at times, in the shaft of the humerus; and when a fracture with a number of inches of overlapping can be brought

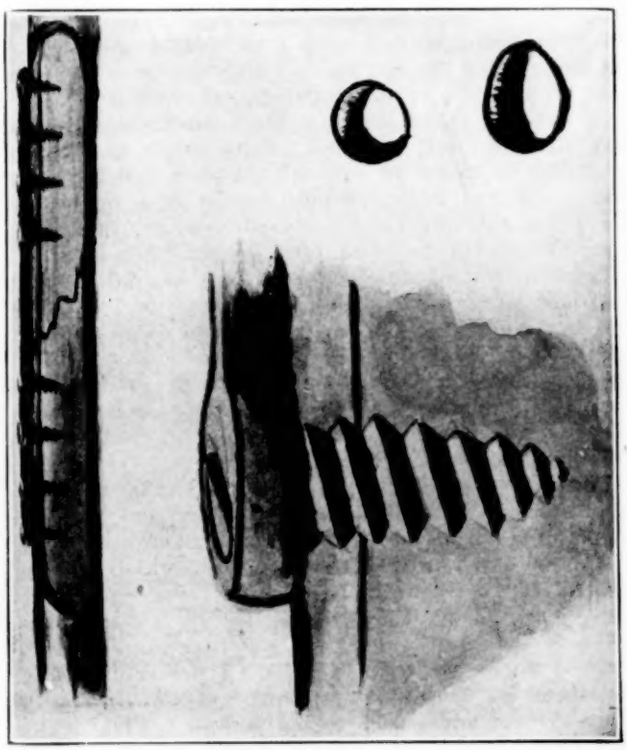


Fig. 12.—Lane plate applied so as to unite a fracture. Note that only about two turns of the thread of the screw are in the hard substance of the bone; the remaining threads are within the lumen of the bone.

down to position and held there, as shown by the Roentgen ray, I shall continue to use that method in such cases. It usually does not involve the use of ether, and I feel that when a fracture is once in position it is easy to hold it there.

DR. A. A. CRANE, Waterbury, Conn.: It is a tremendous relief to me to hear from the gentleman from Providence that there is one old fogy still ignorant enough to use weight and pulley traction. I thought that I was the only one left. I was in France last summer and saw that there were some old fogies left there. For instance, Dr. Joseph Blake was using that method entirely. Dr. H. H. M. Lyle and Dr. Joseph Marshall Flint also used it. It is considered over there as

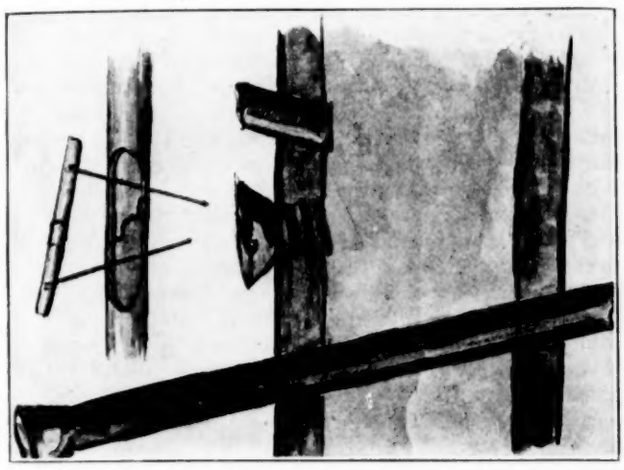


Fig. 13.—Bone gimlet in position: Advantages in the use of pins which transfix the entire forearm.

the type of American surgical treatment. French army surgeons are detailed by their government to study these methods and adopt them. By the method of suspension and traction by weights, springs and pulleys, as carried out by Dr. Blake, adjustment in every direction is possible.

Dr. Ridlon said that we do not know when the fracture is set. They do over there. The results are all verified by the fluoroscope. There may be cases in which this line of treatment cannot be carried out, but it applies to most cases. I used it before I went over and have done so much more since I came back.

DR. JOHN RIDLON, Chicago: I should like to have Dr. Crane say whether, in using that method in France, they constantly verify the position in which the fracture is maintained by means of the fluoroscope, or simply note it once.

DR. A. A. CRANE, Waterbury, Conn.: The fluoroscopic examination is made only once after the reduction is made, and again before the patient is discharged. There is no constant verification by means of the fluoroscope from day to day.

DR. E. A. MCCARTHY, Fall River, Mass.: Dr. Allen can probably use this method with a great deal of skill. I believe, however, that the indiscriminate use of this method by practitioners throughout the country would probably not result in a great deal of benefit on account of its complicated character. As to traction in the reduction of fractures, most men of the present day, I believe, are convinced that traction in the case of a fracture of the femur is passé as compared with the operative procedure in uniting fragments. The patient, himself, on traction for a long time in a reclining position, is a big factor to be considered. In the cases that I have seen and reduced by the open method, it has been possible in many to hold the fragments together without the aid of foreign material. Plaster-of-Paris has been applied after the wound has been sutured. Exceptionally good results have followed this method.

DR. SAMUEL C. BALDWIN, Salt Lake City: The more orthopedic men get to using operative procedures in the treatment of fractures, the less cases of fracture they are likely to get to treat. People do not want to undergo an operation if they can help it.

With regard to the weight and pulley, I would say that there is unquestionably no doubt that a man may lift himself up by his hamstrings, but how many seconds can he hold himself there? A weight attached to the lower portion of the limb, if kept on long enough, will tire out the muscles, allowing extension to be complete; and in a large proportion of cases this will prevent overlapping of the fragments and permit of apposition. Recently a physician in Pittsburgh told me that he was going to operate in a case of fracture of the tibia at the patient's home, because he could not get the patient to go to the hospital. I asked him how much weight he was going to use, and he replied, "Twelve or fourteen pounds." I said, "Put forty pounds on." He did this and the next day it was down. Notwithstanding Dr. Ridlon's statement that he does not know any orthopedic man who follows weight and pulley traction, I believe that nine-tenths of them are doing it; and the more of them that are doing it intelligently, the better the results.

DR. MELVIN S. HENDERSON, Rochester, Minn.: I should like to emphasize what Dr. Freiberg has said. We have heard Dr. Allen talk of his method for several years, and while it is exceedingly interesting, I fail to see any new mechanical principles; but the main objection to it is that as an operative procedure it complicates the operative field and adds another avenue for the entrance of infection. If Dr. Allen would show us statistics to prove the good effects of the method I am sure that we should all be delighted.

DR. H. R. ALLEN, Indianapolis: I do not use a constant force under any conditions requiring fixation energy. Buck's extension is usually associated with a weight and pulley, and I have tried to make it clear that I do not use a constant force when I am trying to secure a constant distance; and you will surely recall from your childhood the unaltered statement in your primer that the force that operates the pulley is the force of gravity which is a constant force, and all primers agree on this point. Bones unite as they are held. It is therefore up to us to hold them straight and in a constant position.

It is disheartening to present this topic to a man of Dr. Freiberg's attainments for several years and find at the end of that time he is unable to discuss the paper. We are sup-

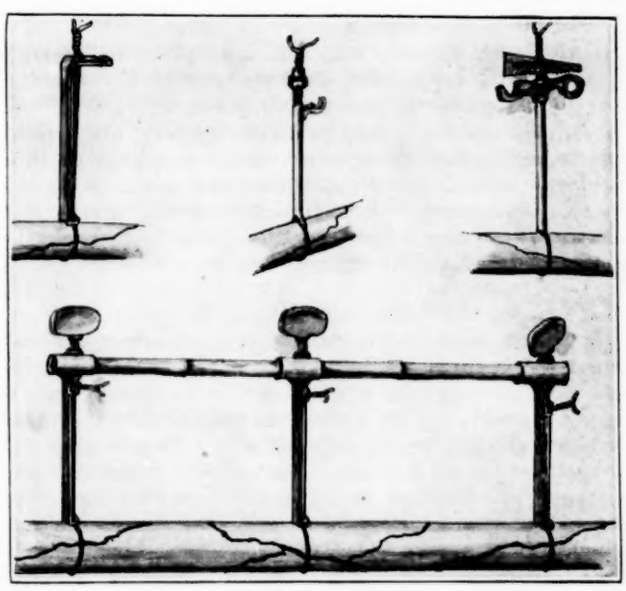


Fig. 14.—Different types of wire stabilizers which are indispensable for use in badly shattered bones.

posed to be dealing with the abstract subject of "mechanical principles" which cannot be Roentgen rayed. We are trying to put orthopedics on a sound and unassailable mechanical basis, and to present Roentgen-ray pictures or other diverting and irrelevant matter would merely confuse the purpose of this paper. It is only fair to add that the application of sound and appropriate mechanical principles will produce most gratifying roentgenograms of united bones.

At every meeting I am asked for the formula of this alloy. It contains 50 per cent. lead, 25 per cent. tin, 12.5 per cent. cadmium and 12.5 per cent. bismuth. The wire loop stabilizers are not through and through devices. I have seen real pus accumulate about them and flow out over the skin without one degree of temperature rise. They are so constructed as to provide sufficient outlet from their base out.

I am very glad that Dr. Ryerson has called attention to the possibility of establishing crutch paralysis by using the splint for fractures of the humerus. Like any crutch made on the nonrigid straplike plan there is less danger of crutch paralysis than with the rigid type of crutch. But it must be remembered that any crutch paralysis also depends on a prolonged and a considerable degree of pressure which is never necessary in this system of treatment for the following reasons.

In the first place there is little or no traction necessary to hold broken bones in their proper place after they have once been pulled down to their proper place. For twenty-five years I have worked diligently on the application of mechanical principles to surgical procedures and I want above all else to have orthopedic surgery put on a sound dynamic basis, since it represents the mechanical division of all medicine and surgery and it should be unassailable in its very foundation. Not one has come out and attempted to discuss the basic principles I have come to present to you. There is not one who can logically account for the basic mechanical principles that he uses every day.

THE THERAPEUTIC VALUE OF ORAL RHYTHMIC INSUFFLATION OF OXYGEN

WITH DESCRIPTION OF A SIMPLE APPARATUS FOR ITS EXECUTION *

S. J. MELTZER, M.D., LL.D.
NEW YORK

The literature on the relation of oxygen to the processes of life, the rôle which oxygen plays in internal and external respiration, and the availability of that gas as a therapeutic measure, is immense. I shall not attempt to review it even in a cursory way, but it may not be amiss to discuss some of the problems of this subject, especially those which we encounter in recent medical literature. We may conveniently divide the discussion of our subject into two aspects: the physiologic and the therapeutic.

THE PHYSIOLOGIC ASPECT

It seems to be the dominant opinion among physiologists that inhalation of pure oxygen or air strongly enriched with oxygen is of no greater oxidative value to the normal organism than the inhalation of simple atmospheric air, which contains about 20 per cent. of oxygen. This view seems to be upheld by two considerations. In the first place, it is a fact that the oxygen in the blood is carried chiefly by the hemoglobin, which, it is generally assumed, is nearly saturated with oxygen and would not take up more of it even if the individual were breathing pure oxygen. The only part of the blood which may take up more oxygen when offered under higher pressure is the serum; but it seems to be generally accepted that the amount of oxygen which the serum is thus able to take up is a small and negligible quantity. The second influential consideration is the assumption, which seems now to be quite generally accepted, that the decision as to the amounts of oxygen which the organism is to absorb rests finally and exclusively with the body cells, that is, with their necessities, activities and storing capacities, and is not influenced by the oxygen pressure within the tissue lymph. In other words, oxidation, the chief process of life, depends on cell activity and not on the tension of oxygen within the blood or within the tissue lymph.

The question under discussion has been the subject of numerous investigations. Lavoisier and Seguin, as far back as 1789, were the first to draw the conclusion from their experiments that "there was no increase in the vital processes as the result of breathing pure oxygen." Probably the last, and surely one of the best and apparently most careful investigation, is the one that was published a few years ago in this country by Benedict and Higgins.[1] They say that a critical examination of the entire literature strongly favors the belief expressed by Lavoisier. But they say that "nevertheless we find that there is much that is lacking in the evidence thus far secured, so that the matter is not yet definitely settled." Their careful investigations, however, led them to a similar result, namely, "that there is no difference in the gaseous metabolism between breathing ordinary air and breathing oxygen mixtures of 40, 60 or 90 per cent.

But even with regard to this careful research, Krogh[2] said: "It is extremely probable, however, that there is in these experiments a slight systematic error," and he comes to the conclusion that the "breathing of oxygen does increase the metabolism to some slight extent."

Apparently there are many factors of greater or lesser importance that have to be taken into consideration before we shall be justified in accepting as final any estimate of the extent of the influence that the inhalation of air with a higher partial pressure of oxygen may exert on the normal gaseous metabolism. The hemoglobin is even normally not completely saturated with oxygen, nor is the oxygen in solution in the blood serum normally an entirely negligible quantity, and it is certainly not negligible during an increase of the partial pressure of oxygen of the inhaled air.

There is no real quantitative analysis of the amount of oxygen present in the tissue fluid. The analysis of the various body secretions does not mean the same as an analysis of the tissue fluid. There are some authoritative investigators who still believe in the storage of oxygen, intramolecularly or extramolecularly, in loose chemical combination or in physical solution. There are other considerations to be solved; but I shall not attempt to discuss any of these points. However, I wish to call attention to one factor which has not yet been taken properly into account, or at least not from the proper point of view, as it seems to me, and that is that element in biology which I designated, a decade ago, as the factor of safety.

All experiments under consideration start implicitly from the point of view that the oxygen content in the air is the physiologic amount sufficient for the maintenance of the life of the animal under normal conditions. But is this entire amount also indispensable? It has been established by many experiments that the

* From the Department of Physiology and Pharmacology of the Rockefeller Institute for Medical Research.

1. Benedict and Higgins: Effects on Men at Rest of Breathing Oxygen-Rich Gas Mixtures, Am. Jour. Physiol., 1911, **28**, 1.
2. Krogh, August: The Respiratory Exchange in Animals and Man, London, Longmans, Green & Co., 1911.

organism remains in a normal condition even if the partial pressure of the oxygen in the air amounts to only 12 or 13 per cent. What is the significance of the considerable surplus of oxygen that the animal is normally breathing? From my point of view it presents a factor of safety in the function of respiration, a factor which I have shown to exist in most of the functions of the animal body.[3] I shall not attempt to discuss again this problem in its details. But it will not be amiss to give an example taken from every day life which will suffice to illustrate the meaning of the underlying principle of the factors of safety and the simplicity of its requirements. Let us take, for instance, two houses of about the same size, of which we have good reasons to expect that each house uses up the same amount of coal in a given time. But while the occupant of one house, who may possess larger means and a greater foresight, lays in a larger supply of coal, let us say, twenty tons at a time, we find the occupant of the other house, perhaps because of lack of means or the necessary foresight, provides himself with only one ton of coal at a time. The difference in the fate between the occupants of the two houses becomes strikingly evident when unexpectedly necessities arise for greater consumption of coal, and when, furthermore, these necessities set in under circumstances of time and place that make coal difficult to obtain.

Life is characterized by the instability and variability of its states, and all its functions must therefore be so arranged as to be capable of being ready to meet the highest possible demands. The function of respiration has for its object chiefly the provision of the organism with oxygen, properly and safely. While, as far as the muscle system is concerned, the provision of the respiratory function with factors of safety is under normal conditions surely of a satisfactory extent, because, as we know, the muscle is capable of continuing its contractions even if the oxygen tension of its surrounding atmosphere is fairly low, it is different with the central nervous system. Here we know that a comparatively slight reduction in the oxygen tension interferes profoundly with the activities of this system. Are we justified in assuming that the addition of 7 or 8 per cent. of oxygen is just the limit of the factors of safety which the respiratory function may need and use under all conditions? Furthermore, in breathing normal atmospheric air, what is the fate of the 7 or 8 per cent. of oxygen present in the normal air above the amount actually indispensable for maintenance of life? Is this oxygen stored away somewhere and in some manner, to be ready for immediate use when needed, or is it normally unabsorbed and got rid of in the same manner as is assumed to be the case when 20 or 30 per cent. of oxygen is artificially added to the atmospheric air?

THE THERAPEUTIC ASPECT

The extensive experiments on which the prevailing view has been founded, namely, that the addition of oxygen to the atmospheric air does not affect the normal metabolism, were made on normal resting individuals. But the processes of life, even in the normal individual, and even while at rest, cannot be represented by a straight line. The processes vary continuously within certain limits; that is life. These variations in the demands have to be met by variations in the supplies which have to be ready in store to the extent corresponding to the maximum limits of the demands of normal life. The 7 or 8 per cent. surplus of oxygen in the atmospheric air is apparently sufficient to meet the maximum demands of the respiratory function of the normal individual when at rest. But would it be sufficient to cover the demands when the individual is engaged in hard work? We know that unusual physical effort leads to shortness of breath, to dyspnea. Could this not be remedied by adding oxygen to the atmospheric air which the hard-working person has to respire? This is indeed the case, a fact which has been discovered and established by Leonard Hill[4] and his co-workers. Hill and Flack[4] found that inhalation of oxygen makes running up and down stairs easier, can be accomplished in a shorter time, relieves the feeling of dyspnea, and restores strikingly the vigor after fatigue from boxing, etc. They believe that the fatigue which follows an athletic feat is cardiac in origin and due to want of oxygen. Haldane,[5] whose great merits in the elucidation of the physiologic relations of carbon dioxid to the function of respiration are well known, was inclined to explain Hill's observation as a result of the deep breathing which is apt to occur in persons to whom oxygen is administered. Haldane's view was later refuted by new experiments, carried out by Hill and Mackenzie,[6] which brought new evidence that the favorable effects that they have obtained were indeed due to the inhalation of oxygen.

From the observations of Hill we learn that the addition of oxygen to atmospheric air exerts a favorable influence under conditions of greater bodily activities. Is inhalation of air enriched by oxygen also capable of exerting a favorable influence when the body is in a condition of rest but is undergoing pathologic processes? In other words, is there any evidence that inhalation of oxygen is capable of exerting a therapeutic effect? This question concerns a wider field than I intend to cover in this paper. There is no doubt now as to the therapeutic value of inhalation of air-oxygen mixtures in cases of poisoning by gases that affect the normal condition of the hemoglobin. But I wish to confine my remarks to the use of oxygen in certain types of diseases. Here we encounter a very unsatisfactory situation. On one hand, hardly a patient, sick with a respiratory or cardiac disease, will be permitted by the physician in attendance to die without trying oxygen inhalation. On the other hand, not many practitioners will readily admit that oxygen is doing much good in these cases.

Two factors are at the bottom of the skeptical attitude of physicians toward the value of oxygen as a therapeutic agent. In the first place, many clinicians are influenced by the view entertained by the great majority of physiologists that the addition of oxygen to the inhaled air is incapable of exerting a physiologic influence, that it does not affect the metabolism, and that the added oxygen returns unabsorbed. Furthermore, many clinicians and pharmacologists are still under the influence of the teaching that there is no fundamental difference between physiologic and pathologic processes. In this connection, the present attitude of the physiologist Haldane is very instructive.

3. Meltzer, S. J.: The Factors of Safety in Animal Structure and Animal Economy, THE JOURNAL A. M. A., Feb. 2, 1907, p. 655.

4. Hill and Flack: The Influence of Oxygen on Athletes, 1909, **38**, Jour. Physiol., **28**.

5. Haldane, J. S.: The Effects of Previous Forced Breathing and Oxygen Inhalation on the Distress Caused by Muscular Work, Jour. Physiol., 1909-1910, **39**, Proc. Physiol. Soc., London, **1**.

6. Hill and Mackenzie: Jour. Physiol., 1909-1910, **39**, Proc. Physiol. Soc., **33**.

As stated above, Haldane doubted that the favorable influence which, according to Hill, the administration of oxygen exerts on the work of athletes is due to oxygen. Very recently, however, Haldane[7] came out strongly for the administration of oxygen in inflammatory conditions of the lungs. He says:

> It may be argued that such measures as the administration of oxygen are at the best only palliative and of no use, since they do not remove the cause of the pathological conditions. As a physiologist, I cannot for a moment agree with this reasoning. The living body is no machine, but constantly tending to maintain or to revert to the normal, and the respite afforded by such measures as the temporary administration of oxygen is not wasted, but utilized for recuperation.

The second, and probably the more influential factor, is the actual fact that practitioners rarely see any favorable effect that may have been brought about by the administration of oxygen. But the general conclusion drawn from this fact, namely, that the inhalation of oxygen is incapable of exerting a favorable influence in pathologic conditions, is unjustifiable. The failure to see such an influence is probably due essentially to the inefficient method of administration. In most instances oxygen is given in a weak current through a funnel which is kept an inch or more from the mouth of the patient. Under these conditions we can hardly speak of "inhalation of oxygen." The atmospheric air which the patient actually inhales is probably not richer by more than 2 per cent. of oxygen, if by so much. On the other hand, the funnel may be instrumental in making the inspired air richer in carbon dioxid and surely makes the air over the face warmer, an unpleasant sensation to the patient, who prefers to be fanned and cooled off. Therefore, we often see the patient pushing the funnel away or turning the head away from it.

THE AUTHOR'S APPARATUS AND EXPERIENCE IN THE USE OF IT

My personal experience dates back about two years. I was called up one night by a very unhappy mother who told me that her only son was dying and begged me to come over. The athletic young man of 25 years was sick with pneumonia, Type II. I arrived at about 2 a. m. and found several physicians around the patient, who was unconscious and deeply cyanotic. Respiration was rapid and very shallow. He had no corneal reflex and there was a thready pulse of about 190 per minute. The patient was apparently dying and the physicians expected death to take place within the next ten or fifteen minutes. Nurses were administering oxygen in the usual manner, that is, through a paper funnel, kept at some distance, the gas bubbling through a wash bottle at a moderate pace. I disconnected the rubber tube from the foot bellows of my pharyngeal insufflation apparatus[8] that I brought along with me, and connected it with an oxygen cylinder. I then inserted the pharyngeal tube in the mouth (not in the pharynx), turned on the oxygen and started working the respiratory valve. Within a short time after the beginning of the oxygen insufflation in the new manner, the cyanosis disappeared and the face of the patient became actually pink. Several minutes after the discontinuance of the insufflation, the cyanosis began to reappear gradually. In the course of the next five hours the experiment was repeated numerous times and invariably with the same result, that is, the cyanosis disappeared promptly during the insufflation of oxygen and reappeared several minutes after cessation of the insufflation. There was no perceptibly favorable influence on the other symptoms of the patient, except perhaps on the pulse. In the morning hours it came down to 180 per minute and was perhaps slightly fuller. At any rate, in the bedside parlance, it could be honestly stated that "the patient was holding his own." The waste of the gas was considerable. A tank of oxygen was used up in a short time. About 7:30 in the morning the supply of oxygen of the neighboring drug stores became exhausted, and it took some time before another tank of oxygen could be procured. Five minutes after the last insufflation had to be discontinued the heart stopped suddenly. The resumption of the insufflation of oxygen about ten minutes later had no effect whatever.

This patient was not saved; but nobody could have expected it when beginning treatment at that terminal stage. His life, however, seemed to have been prolonged, and it is impossible to state how much longer death would have been deferred, if the supply of oxygen had not given out. But this is an insignificant issue compared with the fact that the insufflation exerted an unmistakable effect on the profound cyanosis. Cyanosis, of whatever origin and nature, is a sure evidence that the respiratory function is profoundly disturbed. In the present case the cyanosis promptly disappeared on the administration of oxygen by the new method. Although we are dealing with only one case, each instance in this case in which the cyanosis disappeared on the insufflation of oxygen and reappeared on stopping the insufflation presents a complete experiment, an experiment that we were able to repeat at will. We made more than a dozen such experiments, and the results were invariably the same. These experiments permit at least the provisional conclusion that the insufflation of oxygen by the method employed in this case affects favorably the function of respiration when it is pathologically profoundly disturbed.

In the case here mentioned the apparatus employed was provisionally arranged and applied in great haste without consideration for the great waste of oxygen and other shortcomings. After observing the results, which seemed to be very encouraging, I devised a special apparatus for our purpose which is simple, inexpensive and works very satisfactorily.

The thick walled rubber tubing that is connected with an oxygen tank terminates in a strong rubber bag which, at its distal end, is connected with the proximal end of the respiratory valve.[9] The distal end of the last named device is connected by means of a short piece of rubber tubing with a flat metal tube which we may designate as a "hollow tongue depressor." If the ring of the respiratory valve is kept in the inspiratory position (right side), when the oxygen is turned on, the gas streams through the tube into the bag and from there escapes through the respiratory valve and the tongue depressor. If the ring is kept in the inspiratory position (left side) the oxygen cannot pass through the respiratory valve, and accumulates within the bag. The accompanying illustration shows the last mentioned position.

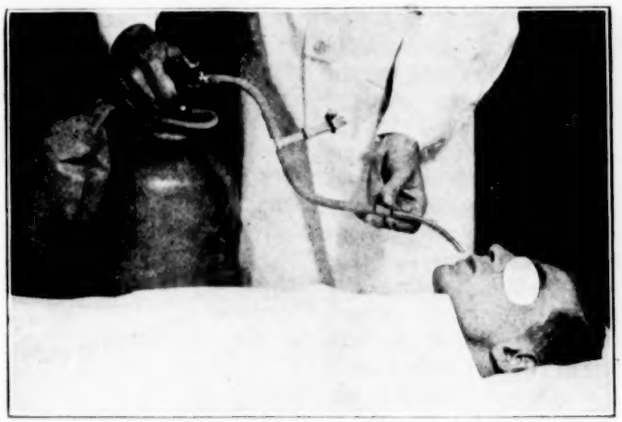
7. Haldane: Brit. Med. Jour., Feb. 10, 1917. Benedict and Higgins (Note 1).

8. Meltzer, S. J.: History and Analysis of Methods of Resuscitation, Med. Rec., New York, July 7, 1917; Pharyngeal Insufflation, a Simple Method of Artificial Respiration, THE JOURNAL A. M. A., May 11, 1912, p. 1413; Simple Devices for Effective Artificial Respiration in Emergencies, ibid., May 10, 1913, p. 1407.

9. A description of this device is contained in the Medical Record, New York, July 7, 1917.

The tongue depressor should be inserted in the mouth not much farther than the middle of the tongue, so that, if the patient is conscious, the presence of the depressor may cause no gagging or other discomforts. The lips should be kept closed. The ring should be moved from left to right and from right to left (a respiratory circle) about twelve times per minute. The oxygen should be turned on slowly, and the velocity of its escape should be controlled, so that it does not cause an overdistention of the bag during the expiratory pause. The turning of the ring to the right should be done slowly, so that the inspiration may develop gradually; the turning to the left is preferably done abruptly. The expiratory air escapes during the closure of the valve through the nose and through the aperture that appears above the closed valve when the ring occupies an expiratory position. It is advisable to time the inspiratory insufflation synchronously with the inspirations of the patient. However, I found that after a while the respiratory phases of the patient become involuntarily adapted to the phases of the insufflation.

I have tested on myself the action of insufflation of oxygen by means of this apparatus. When the insufflation is carried on under moderate pressure, there are no unpleasant sensations whatever. When it is done under too much pressure, the surplus of oxygen escapes through the nose and never enters the esophagus; but it causes some unpleasant sensations which conscious patients will probably not be willing to stand for any length of time.



The oral insufflation apparatus. The rubber tubing which is connected with an oxygen tank terminates at its distal end in a strong rubber bag which in turn is connected with the "respiratory valve." The ring of this device occupies in this illustration an expiratory position; hence the distention of the bag. Above the ring an aperture can be seen, which appears only when the valve is closed (expiratory position). The respiratory valve is connected at its distal end by means of a short piece of rubber tubing with the hollow "tongue depressor." The T tube is here unessential.

My chest was examined by auscultation while I was receiving oxygen insufflation. It was found that each insufflation produced a distinct inspiratory blowing sound which was distinctly recognized even while I was holding my breath. It seemed, further, that the oxygen was capable of entering my lungs even when I was endeavoring to keep the glottis in a state of adduction. Some other objective and subjective effects of the insufflation experiments on myself will be mentioned later.

The results of the observations made by the method of auscultation induced me to make a few experiments on animals. In deeply anesthetized cats, with the thorax split transversely, the insufflation by means of the apparatus was sufficient to distend the lungs moderately with each insufflation, even when the "tongue depressor" was inserted in the mouth, as in the human being, not farther than the middle of the tongue. It appeared, however, that when the tongue depressor was kept at that position, life could not be kept up indefinitely. When the tongue depressor was inserted in the pharynx, the oxygen entered readily the gastrointestinal canal, which had to be prevented by keeping the abdomen compressed. With this precaution the artificial respiration was excellent and the animals remained in good condition. But in this arrangement the method is identical with the method of intrapharyngeal insufflation that I have described elsewhere, and is not applicable to conscious patients.

Dr. A. L. Meyer of our laboratory performed on himself a couple of experiments with the apparatus. After having been insufflated for about eight minutes, he analyzed his expiratory air at the end of the insufflations and found it to consist of nearly pure oxygen. The nitrogen of the atmospheric air was displaced by the oxygen.

The foregoing observations demonstrate that by using the "apparatus for oral insufflation of oxygen" under moderate pressure, oxygen undoubtedly enters the lungs, assists in distending them during inspiration, and displaces largely the nitrogen of the "dead space." The assistance that it renders to the inspiration ought to be of special value when the respiration of the patient is very shallow. The rhythmic character of the insufflation is, on the other hand, of value, as it does away with the resistance which the pressure of the continuous insufflation undoubtedly offers to the expiration, especially when, owing to the low vitality of the patient, the expiratory efforts fail to get succor from the activity of the expiratory muscles. Haldane administers the oxygen by means of a mask. The interruption of the continuous stream of oxygen in his method depends on the force of the expiration, which is expected to close a mica valve and, at the same time, prevents the entrance of the expiratory air into the bag that stores up the oxygen. I developed my simple apparatus about eighteen months previous to the appearance of the communication of Haldane. I then gave up the use of the mask even in my pharyngeal apparatus, mainly because it is liable to drive some deleterious material that may be present in the nasal and the postnasal cavities into the trachea and the lungs, there causing an infectious inflammation. Hill and Mackenzie[6] stated that in giving oxygen during athletic work they did not use the mask, because it increases the dead space. In dealing with sick persons some other points must be regarded as more important. Either the patient is already unconscious, in which case the respiration will be shallow and the expiratory force will be insufficient to close the valves and overcome the pressure within the bag. Or the patient is still conscious and he will surely feel the face piece, which fits over mouth and nose and is kept in position by an elastic strap, as a great inconvenience, and will not tolerate it. Haldane says he had but few opportunities to give his method a practical trial, but he reports that in a case of valvular disease he has seen the cyanosis "clear up at once on the administration of oxygen." There is some other difference between Haldane's method and mine. By Haldane's arrangement the oxygen is accumulated in a bag of thin vul-

canized rubber. This oxygen enters, then, through mouth and nose, under comparatively low pressure, and it was not established whether the stream enters the lungs with any force capable of causing any degree of artificial inspiration. The bag in our apparatus, on the other hand, has thick walls and drives out the oxygen under a pressure which is sufficient, as we have previously shown, to cause a deeper inspiration and as a consequence also a stronger expiration. Haldane says that he knows from experiments on himself and others that the immediate effect of suddenly giving an abundance of oxygen may sometimes be unpleasant. I have taken oxygen many times by means of my apparatus, and sometimes as long as eighty minutes, and never felt any unpleasantness from it. Under stronger pressure and prolonged insufflation there might arise a sensation of dryness. This can be easily remedied by interpolating between the oxygen tank and the bag a wash bottle containing a Ringer solution. I agree, however, with Haldane that the oxygen should be turned on slowly.

Not being any longer in private and hospital practice, I am not in the favorable situation to have many opportunities for testing personally the value of the method. I am, nevertheless, in a position to report encouraging and instructive results obtained in a few cases, three of which were observed at the Rockefeller Hospital. I have to thank Dr. Chickering for the details in these cases. The first case was a most gratifying one. One forenoon in November, 1916, Dr. Cole, the director of the hospital, telephoned to our laboratory asking me to come over and administer oxygen with my apparatus to a pneumonia patient. To my reply that I would be over in half an hour, as I had to finish an experiment, Dr. Cole remarked that in all probability it would then be too late. I went over immediately and started the administration of oxygen by means of the oral insufflation. That patient recovered. Concerning the details of that case I shall quote Dr. Chickering.

REPORT OF CASES

Case 1.—The patient came in on the second day of his disease having signs of consolidation of both lower lobes of the lungs. . . . A Type II pneumococcus was recovered from the sputum. . . . He was treated with ethyl-hydrocuprein (optochin) on the third day of his disease, and this treatment was continued during the fourth, fifth, sixth and seventh days . . . partly by mouth and partly intramuscularly. On the fourth day of his disease the patient appeared extremely ill, temperature being 103.4 F., pulse 152, and respiration 40. He was delirious, color was ashy gray, lips and finger tips very cyanotic and tracheal râles were marked. At 10:45 a. m. the patient was given oxygen according to Dr. Meltzer's method intermittently for about two hours. While the oxygen was being given, his color changed surprisingly; his lips and ears lost their cyanotic color and took on a pinkish tint, and his general condition seemed decidedly improved. The following morning the patient's temperature and pulse were lower, 100.5 F., pulse 104 and the respirations 32. His temperature gradually came down by lysis to normal on the twelfth day of his disease. Convalescence was uninterrupted, no complications developing except a moderate amount of sterile pleural effusion which gradually cleared up without aspiration.

Case 2.—The patient was admitted, Feb. 19, 1917, and the oxygen treatment was begun on the twelfth day of the disease, one hour before death, February 28. The patient received ethyl-hydrocuprein treatment every day from the fourth day of his disease to the twelfth, the day of his death. On the day of his death, his blood culture contained innumerable colonies of pneumococci of Type II. "On the afternoon of his death his color suddenly changed . . . and severe cyanosis developed." Oxygen treatment was started. "While the oxygen was being administered, patient's cyanosis became less intense, but as soon as the oxygen was stopped cyanosis rapidly returned."

Case 3.—The patient was admitted to the hospital, Feb. 25, 1917, on the first day of the disease. "The next morning the whole right chest was involved posteriorly, and on the following day signs appeared anteriorly. At the same time the left chest became filled with fine moist râles. From the sputum an atypical Type II pneumococcus was obtained. Blood culture was sterile, blood count 29,000. . . . On the fourth day of the disease the signs became more marked for the left lower lobe; the temperature rose to 104.5 F. and the pulse to 140. The patient became pale and cyanotic. The extremities were cold and expirations labored and moist. Ethyl-hydrocuprein was begun at 2 p. m., and oxygen at 3 p. m.[10] . . . During the afternoon the pulse rate gradually increased to 142 (8 p. m.). The semicomatose, delirious condition deepened into unconsciousness about 7 p. m. From then on, the color could be maintained with oxygen, but the pulse quality became poorer; respirations increased from 44 to 60, and the patient's throat gradually filled with mucus. There was dulness over the left lower lobe, with râles throughout the left chest. From 2 a. m. to 6 a. m., the time of death, it was necessary to use oxygen continually in order to maintain respiration. If the oxygen was stopped for a few minutes respiration became more shallow and slow, and a dull blue flush appeared on face. This immediately disappeared with more oxygen. Gradually her color and respiration failed in spite of continual oxygen and the pulse, which was good almost to the end, because more feeble and gradually less rapid, until it failed entirely at 6 a. m."

COMMENT

In these three cases the pneumonia was due to pneumococcus of Type II, for which an efficient antiserum has not yet been developed. In all three cases the oxygen treatment was instituted very late, when the condition of the patient already appeared to be quite hopeless. Nevertheless in all three cases the oxygen insufflation manifested the tendency to exert a favorable influence. Even in the second case, in which the oxygen treatment began only one hour before death, the cyanosis of the patient became less intense while the oxygen was administered, to return rapidly when the oxygen was discontinued. This favorable effect on the cyanosis was still more striking in the other two cases, in which each short series of insufflations produced a change of color which outlasted the insufflation by shorter or longer periods. In the first case the face had a leaden, ashy gray color which is characteristic for oxygen deficiency.[11] This color disappeared quite soon after I started the insufflation, and the face gradually assumed rather a pinkish appearance. When I first saw the patient I understood why Dr. Cole thought that the administration of oxygen after half an hour might prove to be too late. I had little hope that the administration of oxygen would save the life of the patient. He was unconscious, had no corneal or lid reflex, the pulse was rapid, small, with very little tension, and the tracheal râles had the death sound. Nevertheless, that patient recovered. The third patient, who received oxygen insufflation for about fifteen hours, died; the pneumonia in this case was very extensive; it spread over both lungs. But here again, besides the pronounced action on the cyanosis, there seems no doubt that the oxygen insufflation prolonged the patient's life. We may be, in fact, we ought to be, optimistic

10. In the first few hours the oxygen was administered without expiratory interruptions.

11. Haldane: Brit. Med. Jour., Feb. 10, 1917.

enough to assume that in conjunction with the use of some other efficient or even only semiefficient remedies, early insufflation of oxygen may offer a chance even to patients of this type.

The third patient has taught another favorable lesson, namely, that the oral insufflation of oxygen may assist in maintaining respiration. In the last few hours of her life, when the insufflation was stopped, the respiration became shallow and slow, and a dull blue flush appeared on her face which disappeared as soon as the oral insufflation was begun again. It acted apparently like artificial respiration. This fact reminds me of the statements previously made with reference to the auscultation of my chest while receiving oral insufflation, and to the behavior of the lungs in animals under the same condition.

I shall record further observations made by Dr. Victor Meltzer on a woman, aged 60, with marked arteriosclerosis and hypertension. For the last two years she was most of the time subject to cardiac dyspnea and had frequent and severe attacks of pulmonary edema. In the last two months of her life, oxygen was administered to her by means of the apparatus for oral insufflation during the attacks of dyspnea as well as those of pulmonary edema. It proved to be of great value, and afforded the patient great relief. When administered at the beginning of an attack of edema, not infrequently it prevented its full development. Among the most noticeable effects were the rapid disappearance of cyanosis.

Before concluding, I shall record briefly two observations made on myself. For experimental purposes I had oxygen administered to me several times by means of oral insufflation for periods lasting between thirty and eighty minutes. Objectively I can state that the insufflation brought high color into my face, which was noticed by persons who did not know of my experiment, and which did not leave me for several hours. Subjectively I found that it removed the sensation of fatigue and that I felt stimulated for the rest of the day. Of course, the latter fact might not have been due to the insufflation of oxygen. Not infrequently a successful experiment may bring about similar results. At any rate, both facts concern the problem of the possibility of a physiologic action of oxygen when administered by rhythmic oral insufflation, a problem which I shall not discuss here.

SUMMARY AND CONCLUSIONS

In four pathologic cases it was definitely established that the rhythmic oral insufflation of oxygen reduced or removed promptly the cyanosis, and in three of the cases the patient turned even pinkish shortly after the insufflation was begun. Without doubt these prompt effects must be ascribed in the first place directly to the action of oxygen. But it must be admitted that the rhythmic insufflation, since it is capable of assisting in the maintenance of the respiration, may be helpful in the ventilation of the lungs and thus helpful also in the removal of some of the accumulated carbon dioxid. The favorable action of the insufflated oxygen may be explained in various ways. It may simply be due to the presence of the oxygen in the blood serum in greater quantity, as a consequence of the greater oxygen tension in the alveolar air. It may be further assumed that in certain pathologic conditions the hemoglobin is not saturated with oxygen and therefore takes it up readily from the serum, and furthermore, in certain stages of the disease the oxygen thus taken up may be retained by the hemoglobin for shorter or longer periods even after the oxygen tension in the alveolar air and in the serum is again reduced. The same may perhaps be said of the other vital body cells, the nerve cells of the medulla and the cells of the circulatory neuromuscular apparatus. In the course of a disease either the cells are gradually receiving less and less oxygen, or they gradually lose the capacity for storing up oxygen, or both. There are other possibilities; but I shall not merely speculate as to which of these possible factors were the effective elements in the observations previously mentioned. But I shall point out the following facts. In one case of pneumonia the cyanosis returned immediately when the oxygen insufflation was stopped. In this case surely the vital cells had no longer any storing capacity. This patient died one hour after the insufflation was installed. In the case of another patient the insufflation had at first a marked after-effect when the insufflation was discontinued, but gradually this storing capacity disappeared and the patient was kept alive for several hours longer by continuing the insufflation without intermissions. In this patient, when the insufflation was first begun, some degree of storing capacity of the vital cells for oxygen was still present, but it was on its down-hill course, which the oxygen insufflation could neither revert nor stay. In my first patient each series of insufflations was followed by a period of freedom from cyanosis. These periods were short, but for five hours the periods did not become shorter; "the patient held his own," and he died suddenly when the period before oxygen could be again administered became too long. In this patient the down-hill course was stayed; whether it could have been reverted by further administration of properly timed insufflations of oxygen was at that time more than doubtful. But the condition of the fourth patient, who actually recovered, was, when first seen, as grave as that of the last patient. Nevertheless, the rhythmic oral insufflation of oxygen not only stayed the down-hill course, but undoubtedly assisted in reverting it to normal.

To recapitulate briefly: Four cases of pneumonia due to pneumococcus Type II were treated by oral insufflation of oxygen. In all cases the treatment began when the condition of the patients was already very grave and apparently hopeless. In all cases the cyanosis improved soon after the insufflation was started. In one case the cyanosis returned immediately after the insufflation was stopped. There was apparently no more storing capacity whatsoever for oxygen. That patient died one hour after the beginning of the treatment. In the second case there was at the beginning a definite storing capacity for oxygen which, however, gradually disappeared. The life of that patient was then kept up for several hours by continally administering the (rhythmic) insufflation of oxygen. In a third case the storing capacity was small but remained unchanged for five hours. The patient died during a prolonged period when oxygen could not be readily procured. The fourth case, which practically was as hopeless as any of the foregoing, showed a definite reversion in the direction of recovery about two hours after the treatment by means of oral insufflation of oxygen was begun.

It seems justifiable to assume that the period of definite cyanosis is preceded by a more or less long period during which the capacities for taking up oxygen, and storing it, by the vital cells, are gradually

getting impaired; and it is further justifiable to assume that during early pathologic periods the insufflation of oxygen may be capable of restoring these capacities to their normal extent more frequently and efficiently than during later stages. The early insufflation might thus be the means of preventing the disease from reaching the stage of cyanosis. In other words, early administration of oral insufflation in pneumonia and similar diseases may prove to be a real therapeutic measure. In normal conditions the individual inhales air which contains about 30 per cent. oxygen above the physiologic need. This surplus presents the factor of safety for the healthy, moderately active individual. During sickness that gradually leads to respiratory insufficiency, the loss of the capacity of the vital body cells for taking up and storing oxygen, the factors of safety for this vital gas ought to be then considerably larger than in normal conditions. It is true that, experimentally, we shall be the losers. If the patient recovers under early administration of oxygen insufflation, we shall in most cases be deprived of the absolute evidence that the recovery was actually due to the treatment. But we must give the benefit of doubt to the patient.

I recommend, therefore, that in pulmonary and cardiac disease oxygen should be administered by means of the oral insufflation several times a day at an early period when there is not yet an urgent necessity for it. Oxygen should not be considered as a terminal measure. On the other hand, it ought to be emphasized that oxygen should not be considered as a specific, and its use should by no means eliminate the use of other promising remedies. On the contrary, oxygen may make the body cells more amenable to the curative action of other therapeutic agents. Furthermore, the oral insufflations offer a chance to other therapeutic agents to develop their favorable action.

THE PLACE OF INFANT WELFARE IN PUBLIC HEALTH INSTRUCTION *

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Hygiene has been defined as that department of knowledge which concerns the preservation of health. It not only includes the various branches of the so-called medical sciences, but lays tribute on any knowledge or practice which may be serviceable in combating disease and in promoting health.

It is the fundamental duty of all governments to provide for the safety of their people, even at the sacrifice of individual right, liberty and property. This function is exercised under the common law as a police power, and implies the right of a government to secure for its subjects healthful living conditions. Under the government of the United States, the authority for this sanitary provision is vested in the separate states, rather than in the federal government. The latter exercises its right of control only in exceptional cases, namely, in interstate traffic, in cases of threatened general epidemics, and in maintaining advisory authority over quarantine. This federal control is exercised through the Public Health Service, a branch of the Treasury Department, while supervision over food and drugs is under the control of the Department of Agriculture; whereas the vital statistics, which form so fundamental a part of all public health work, is a division of the Bureau of the Census of the Department of Commerce.

Prior to the nineteenth century, boards of health were organized in the larger cities along the Atlantic coast, but little was done except when outbreaks of severe epidemics required that unusual steps be taken to control them. Later, local boards of health were formed in other inland communities; but the first state board of health was organized in Massachusetts, in 1869. Since then, in practically all the states, some duly authorized body has had charge of matters pertaining to public health. In many states there are laboratories where various examinations are made for physicians practicing in the state. In the laboratories of other states valuable research work is being carried on.

The functions of the state boards of health have been developed in a haphazard rather than an orderly fashion. Each state has gone its own way, often regardless of the experience of other states and countries, and much time, money and labor have been wasted because of lack of cooperation. This is in no small measure due to the domination of politics and to the fact that there exists in the United States a serious lack of trained and experienced hygienists.

To supply this need for competent workers in public health, a number of medical schools are offering more or less extensive courses in preventive medicine, and there are a few thoroughly equipped institutes of hygiene.

In connection with ten medical schools, at present, graduate courses in public health have been established. Seven of these schools give the degree of Doctor of Public Health, three after a two years' course, and four after a one year course. The degree of Certified Sanitarian is given by one university, after a one year course, to graduates of arts and sciences. The degree of Master of Public Health is conferred by two medical schools, and the degree of Master of Arts of Public Health, or Master of Science of Public Health, is given by three other universities, and the degree of Graduate of Public Health by one.

The subjects considered in one of the more complete courses in public health include preventive medicine and sanitary science, consisting of epidemiology and tropical medicine; personal hygiene, having to do with choice of foods, ventilation, exercise, sleep, etc.; industrial hygiene; public health administration; sanitary biology and chemistry; communicable diseases; sanitary engineering; demography; eugenics; infant mortality; school hygiene, and tuberculosis and venereal prophylaxis.

Even such a cursory summary of information to be obtained at a well established school of hygiene must convince physicians and intelligent laymen of the value to the future well-being of the country of the propagation of such knowledge; and all physicians will admit that but a small proportion of this knowledge, in its relation to public health, is given in the ordinary medical school curriculum. In other words, it has become evident that preventive medicine is a distinct, specialized science, offering unusual opportunities of service to those well equipped students who care to pursue it.

* Read before the Section on Preventive Medicine and Public Health at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

When we consider that there are constantly about 3,000,000 people sick in the United States, involving an annual financial loss of more than $500,000,000, and that a considerable proportion of this illness is preventable, it is readily understood that preventive medicine offers a field almost unique in its service to humanity.

It is the purpose of this paper to present briefly the importance of infant welfare work in any properly considered and thorough instruction in public hygiene.

Several general facts in reference to infant mortality would seem, of necessity, to place infant welfare work, that is, all efforts to reduce infant illness and death, in the van of any movement having to do with public health. These facts are briefly as follows:

Eighteen per cent. of the total mortality of all ages occurs under 1 year. Infant mortality can be reduced by known methods, from one death within the year, to every five babies born (which is the rate in many portions of the country), to one death in every twenty babies born, which is the rate under satisfactory hygienic conditions, and which means the saving each year in the whole country of approximately 200,000 lives, a larger number than would be saved by the complete eradication of tuberculosis. If the capitalized value to the state of an infant life is, as has been claimed, $5,000, the loss of wealth represented by this human wastage can be roughly estimated. It is to be emphasized, too, that babies who come healthily through their first year look forward to a much longer life expectancy than do the cured patients from any illness.

As has been well said by Dr. Woodward of Washington:

> The day has gone by when the public health officer can look on the abating of nuisances and the control of preventable diseases as the chief part of his duty. Infant mortality presents as great a problem for the health officer as does smallpox, scarlet fever, infantile paralysis, school hygiene or anything else.

In presenting the subject of infant welfare to students of hygiene, three distinct lines of approach should be followed. In the first place, infant welfare must be studied in relation to other branches of hygiene, of which it is an integral part. Therefore, much that should be taught in the general curriculum of such a school requires no duplication in presenting the subject of infant welfare, except that the relation of the latter to the subject considered must be emphasized. For it is true that nothing is done in the community to improve health conditions in general which does not help the baby. Thus, for example, vital statistics, particularly birth registration, form the foundation of any intelligent infant welfare work. These subjects would, of course, be presented in relation to other matters of public health. The same can be said of general sanitation, housing, water supply, milk supply, and of industrial occupations and venereal disease in their relation to the health of the infant. Secondly, measures already in operation should be thoroughly studied and compared, and those best suited to any given community should be determined. For example, in some cities distribution of modified milk, or the encouraging of day nurseries, or the licensing of midwives, may be distinctly advantageous, whereas in other cities they might be harmful. Thirdly, not only should we "prove all things and hold fast to that which is good," but an institute of hygiene offers incomparable opportunities for ascertaining new facts which should lead directly to the saving of infant life.

In suggesting a brief outline for the study of infant welfare, I avail myself, among other sources, of the *Transactions* of the Association for the Study and Prevention of Infant Mortality, and of many valuable suggestions of Miss Knipp, its executive secretary.

It would seem that infant welfare falls naturally into two main divisions, one of which has to do with having better babies born. It presents as an ideal that every conception should result in a healthy baby. This leads at once to a discussion of the science of genetics and eugenics. Here one must tread cautiously, as there is much in theory which cannot be put advantageously into practice. It would seem, however, that the reasons for the prevention of the marriages of the notoriously unfit, and of the segregation or the unsexing of such persons, should be presented from the standpoint of the baby's welfare. Again, the effect of acute and chronic alcoholism, or of the abuse of other habit-forming drugs, in one or both parents, on the well-being of the child should be discussed from a thoroughly scientific point of view. The whole question of syphilis should be studied with special reference to stillbirths, premature births, and lowered infant vitality. The effect of tuberculosis in parents on the vigor of the offspring must be presented; likewise the effect of factory work, or hard manual occupation, on the part of the pregnant woman.

Then, in connection with the obstetric department, steps should be taken to bring about more skilful, aseptic obstetric practice. The question of training or abolishing midwives in this country, the early registering of expectant women at the obstetric clinics, thorough prenatal care, adequate obstetric service in rural districts, the establishment of obstetric substations under the control of health departments: these and similar subjects having to do with getting babies well born are parts of infant welfare.

A second division of the subject would consist of a study of the causes of illness and death during the first year. These divide themselves into several important groups, which should be discussed separately:

1. *Congenital Debility, Prematurity, etc.*—It has been long known that a third of the deaths in the first year occur in the first month, many of them in the first week of life. The reasons for this are not thoroughly clear, but the data should be collected and carefully analyzed.

2. *Digestive Diseases.*—It is in this group that nearly all the progress made in recent years, in reducing infant mortality, has taken place. The various plans carried out in this country and abroad which have resulted in the reduction of disease and death from digestive disturbances should be presented from a historical point of view, and those means which are most efficient and best applicable to our own conditions should be pointed out.

3. *Diseases of the Respiratory Tract.*—This group of ailments presents now a danger to the infant practically equal with the diseases of the intestinal tract; but little light has been thrown on the subject, and much of our knowledge of the spread of pulmonary infections has not been made use of in pediatrics.

4. *Acute Infections.*—Fortunately, the baby leads a partially isolated life. It is peculiarly susceptible, however, to infections, and should be protected from them. When infectious diseases are controlled among

schoolchildren, through proper sanitation and health administration, the infant will be the gainer.

Other conditions, resulting in the destruction of infant life, including deformities or defects in development, are little understood, but are almost negligible compared to the loss of life from the conditions already referred to.

Another group of babies among which there is a high mortality, and which require unprejudiced, tactful treatment, are the babies at present reared in institutions, many of whom are of illegitimate birth. The reception of these children by institutions began in the seventeenth century, under the advice of St. Vincent de Paul. This practice has tended to increase both illegitimacy and infant mortality. No better illustration could be given of the fatal partnership of good intentions and wrong methods, and it is on questions such as this that the impartial balanced judgment of an institution devoted to scientific hygiene can be of incalculable value. It is important to show to future health officers that immorality is checked, the mother's self-respect restored, and many sturdy infant lives saved, by keeping mother and baby together during the early critical months, and in helping her to secure remunerative occupation amid sympathetic surroundings. We need unprejudiced investigation of the mental capacity of many of these unmarried mothers. We need, too, a light on the notoriously large mortality in institutions, and directions as to the best methods of reducing it, or of substituting foster homes for children bereft of parents.

A large number of other topics must be considered in any complete outline of courses on infant welfare. Some of them are:

1. Study of the milk supply of a community in relation to infant welfare. This could be carried out in connection with other courses in sanitary milk production.

2. Maternal nursing, in its relation to infant mortality, particularly in the homes of the indigent.

3. Housing conditions, which are of fundamental importance in the well-being of the infant. In this connection it should be stated that in any institution situated in a southern city special emphasis must be laid on the health conditions among the negro population. In view of the fact that the negro presents more than double the white death rate and morbidity rate, especially for infectious and venereal diseases, this race constitutes a problem of its own in which infant welfare plays a vital part. The negro needs more sympathetic and kindly, but firm, treatment, and less exploitation. Their low living conditions in many parts of the South, the prevalence of infectious disease and puerperal fever among them, and the kind of food they give their children leaves everything to be desired; and yet there are 10,000,000 of them among us, thus constituting more than 10 per cent. of our total population. It is estimated that about half a million of this number are constantly ill, thus entailing a loss of millions of dollars in the communities in which they live.

Another subject in which the infant is gravely concerned is the wage of its parents. Insufficient income and the resultant low standard of living are always associated with high infant death rate. This has been shown by a number of recent investigations, notably in Johnstown, Pa., where the infant mortality in families earning less than $10 a week was more than 200 per thousand, while, when the income was more than $25 per week, the infant mortality rate was about 80 per thousand. These and similar facts demand careful attention, not only in an institution of hygiene, but also on the part of sociologists. Can they be met by the gradual raising of the standard of our wage earners, by a system of health insurance, or will the working men in America, as in other countries, eventually limit the size of their families? Low wages for the men of the family make it necessary, of course, for the women of the family to work to avoid starvation. This results in absence of the mothers from home and in the neglect of the children. It is interesting to recall that in Lowell, during a strike, when the mothers could not work, infant mortality was reduced; and that during the siege of Paris, when the general mortality was doubled, the infant death rate was halved.

5. This leads to a consideration of what is perhaps the most important element in the welfare of babies, namely, intelligent care on the part of their mothers. No outline of courses having to do with infant welfare would be worth while that did not stress as perhaps its pivotal point the importance of the education of the present and future mothers of the country in those matters pertaining to the feeding and care of their children. If this instruction can be given in all our schools, and the social conditions can be adjusted so that wages compatible with decent living are possible for all families that are willing to work, much of the infant mortality problem would be solved. This education of girls in infant welfare has been carried on, in some form or other, in various parts of the country, for a number of years, in private and public schools, and in so-called continuation schools, and in "little mothers' health leagues."

It is the duty of an institution devoted to hygiene to study the character of this instruction and the results obtained when these girls have homes of their own, and to determine what forms of instruction may be best adapted to particular communities.

The child of run-about age, between the infant and the school boy or girl, also needs special study. He suffers often from neglect, from improper food and clothing, and from the lack of fresh air. Many serious conditions start before school age begins.

The infant mortality movement, as it is generally understood, began in France in 1892 with the "consultations des nourissons" of Budin. From this time on, in an incredibly short period, infant welfare work of various kinds has spread over nearly the whole civilized world. Milk stations have been organized in many large cities, hundreds of nurses and physicians are devoting their time to this form of philanthropy, and divisions of child hygiene have been organized in the departments of health in New York, Philadelphia, Boston and other cities.

The care of the expectant mother is now conceded to be essential for thoroughgoing infant welfare work.

The National Association for the Study and Prevention of Infant Mortality was organized in New Haven, Conn., in 1909, and since then its office has exerted a guiding influence in this whole movement. The *Transactions* of the society reflect the progress that has been made. In 1912 a federal Children's Bureau was established, in which infant welfare work was made a feature. This bureau has made a number of exceedingly valuable investigations on the infant mortality rate under various urban and rural conditions. Divisions of child hygiene have been created

in several state departments of health, including New York, New Jersey, Kansas and Ohio.

It should be the purpose of an institute of hygiene to acquaint the students taking infant welfare courses with the history of the movement and with the methods that have been used in other countries and in our own to conserve infant life. New Zealand, with its infant mortality rate of less than 5 per cent., deserves special consideration.

Finally, in many cities, in cooperation with existing agencies, such as the infant welfare associations, the health departments, and the obstetric and pediatric departments of medical schools, it is possible for students of hygiene to obtain a large experience in practical infant welfare work on the field; to see for themselves the many examples of the deleterious influence on the baby of poverty, bad housing conditions, improper food, and ignorance on the part of parents, and to note also the dire results of long institutional life on young infants. These students will thus have abundant opportunity to form their own conclusions as to the efficiency of the various agencies in meeting and correcting circumstances so inimical to infant health.

If the subject of infant welfare work can be presented in some such fashion where instruction in hygiene is thoroughly given, no interested student could receive his degree and take up his public health work in any community without knowing something of the value of infant life and something also of the measures best adapted to promote it.

At this time of stress and danger, when the youth of the land are about to offer themselves for the service of their country in battle and many of them may be called on for that last measure of devotion, it is especially timely that all efforts tending to improve the health of the people should be fostered, and particularly is it vital that the infant population, on whom in due time the future of our nation must depend, be carefully enumerated and conserved.

ABSTRACT OF DISCUSSION

DR. WILLIAM H. WELCH, Baltimore: The most promising line of attack on the prevailing death rate is to control the diseases of childhood. We can accomplish more there, make more impression, and it makes a stronger appeal than anything else, I think, on the community at large.

As regards the relation of school hygiene and public health to this work, that, again, seems to me so apparent that it requires no particular emphasis. As to the details of that I am hardly prepared to speak. It is obvious such an institution must be in close connection with the pediatric clinic during the organization of the service of the schools or hospitals, which have been such a tremendous accession for our municipal and state departments of health, especially in the work that the Public Health Service has done in that connection, and with all the official and voluntary organizations, of which we have so many. Those who are studying in this field should have every opportunity. Perhaps I should like to emphasize as much as anything, although it is only one of the many functions of school hygiene, the importance of increasing our knowledge on the subject. While it is true that we do not apply, or begin to apply, all that we know, nevertheless the whole field is full of still open and unsolved problems; and nothing is more certain than that failure revolves around this, when we attack the problem of controlling a given disease without spreading active knowledge as to the mode of origin and the spread of the disease.

I should like to know a little more of why it is that there is such a tremendous difference between the so-called individualized care of the infant at home, boarding out, and in institutions; and I expect that field can be narrowed a great deal more than it has been.

DR. HENRY DWIGHT CHAPIN, New York: There was one question raised by Dr. Welch as to the cause of the difference of the mortality in boarded out babies and in institution babies. There are several causes that favor the high mortality of institutions for the baby; and here is the proper point at which this question must be attacked, and successfully attacked; the very high mortality in infants can be checked right there. First is the lack of a sufficient number of attendants. Babies are brought into the world singly, and not in droves; and they are not intended to be cared for in great masses. And the second reason is, they do not get enough fresh air. They lack a sufficient supply of fresh air that very few institutions can give them. Third, they lack a mother; and if they cannot get their own mother, they ought to have somebody else's mother. The subject of boarding out has not been sufficiently studied, nor sufficiently systematized. If the same work, the same attention to detail, the same study were given to putting these little babies into homes as is given to institutions, we would cut the mortality in half at once. They must be boarded out in units, under the constant supervision of a physician and nurse who are familiar with this class of cases and competent to deal with it. The Speedwell Society has successfully operated along these lines for the past fifteen years.

DR. ROWLAND G. FREEMAN, New York: I do not want to discuss the excellent paper of Dr. Knox so much as I want to say a word for institutions. All the evidence that we are getting now from people studying these infant problems is in favor of the boarding out of children. I myself feel that an institution is the best place for a child, if it is a good institution. We have our old institutions that had 100 per cent. mortality; we have, more recently, institutions with 20 to 30 per cent. mortality; and we have other institutions where we keep the children out of doors, where we have plenty of nurses, and where children do better than they do in their homes; and I am in the habit, with difficult cases, of sending them to a hospital where they can have good, fresh air, proper food, and good nursing, and they do much better than they do in the homes. The institution has to exist as a clearing-house for babies. It is all well enough to board them out; and I believe that is the best solution for the large proportion of the babies coming to our institutions; but you must have the institutions to receive them and board them out; and you have to have the institutions to take care of them when sick. One reason why large institutions are rated as having such a large mortality is because all of their hundreds of boarding-out children when they get sick come back to the institution and the institution, not the boarding-out home, where they become sick, is credited with their deaths.

DR. A. F. HESS, New York: I should like to say a word, also, in favor of the institution. I do not believe, with Dr. Chapin, that there is anything inherently good or inherently bad in institutions or in the boarding-out system. They can be well managed, or they can be poorly managed. Now as regards the boarding-out system, there are no statistics which show that it can be better managed than an institution. I have seen mothers who take care of babies, mothers who are licensed by the department of health, whom you would not think of entrusting with the care of babies. It is true that the department of health is now doing much better in this respect. I understand that there are now some 500 who are entirely trustworthy, but we must remember that we need 5,000 such mothers, as there are 5,000 babies to be boarded out. I believe that mothering is a very bad thing for a baby; mothering often leads to tuberculosis. I find at the Preventorium that a great number of the infants have developed tuberculosis from contact with the mother who had an open tuberculosis. Furthermore, it is not infrequent for babies to develop colds, pneumonia and die owing to the fact that the mother has had a cold. I have therefore come to believe that a baby is much better off if left alone and not mothered too much. We should not be too radical or destructive. There may be good boarding-out systems and be good institutions; let us make use of the good and abolish the poor ones.

DR. J. H. MASON KNOX, JR., Baltimore: The institutional care of young babies is a question of the character both of the institution and of the foster home. In institutions as constructed years ago and which have an inadequate number of poorly trained attendants, the infant mortality is frightfully high; much higher than in even indifferent foster homes.

The term "mothering" has been objected to on the ground that it may imply too much fondling. We might perhaps better substitute the phrase, "individualizing care." I agree with Dr. Hess that too much unintelligent mothering is a great disadvantage; but I believe that the baby, absolutely dependent, as it is, on others, does best when it has individualizing care; this cannot be obtained unless there is one caretaker for every three or four children. When this is furnished so that the babies' wants are promptly supplied, and there is abundant air space and quiet, it really does not make much difference whether the baby is in an institution or in a foster home.

SIMPLIFIED TECHNIC IN LAMINECTOMY *

WITH DESCRIPTION OF COMBINED LAMINECTOMY AND SPINE FIXATION BY BONE TRANSPLANT

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The operation of laminectomy has become so well standardized that one feels a certain hesitancy in presenting modifications. However, the technic that I have employed during the past few years has been found rather simpler than that of methods previously described, so that a description of it appears warranted.

Briefly, the essential point lies in the fact that instead of stripping the soft parts and the periosteum from the posterior vertebral spines on either side and then cutting off the spines at their bases, the spines are split longitudinally into right and left halves, just as in the Albee operation for insertion of a bone transplant in Pott's disease. However, instead of deflecting the halves on one side only, as in the Albee technic, the split halves are deflected on both sides. It is then a very simple matter to separate the periosteum with attached soft parts from the laminae as far laterally as the articular processes. The posterior spines should be split well down to their bases. There is then left only a small remnant of the process to be cut away with bone cutting forceps. The cutting away of the laminae can be accomplished by any one of the numerous methods advised.

Details of Technic.—The first steps are like those in the Albee spine fixation. A curved incision is made slightly to one side of the row of posterior spinous processes through the skin and subcutaneous tissue. The flap is rapidly reflected, exposing the deep fascia on either side of the middle line. With a stout knife, a straight incision is made down the middle line, splitting the supraspinous ligament and incising or at least marking the tips of the spinous processes themselves. A tenotomy knife is now used to dip down between the individual spinous processes, dividing the interspinous ligaments. With a very thin chisel the spines are now split through the line indicated, care being taken to keep as close to the middle line as possible. On reaching the base of the spinous processes, the chisel is driven slightly to one side, and the corresponding halves are broken and deflected to that side. With a gauze sponge over a periosteal elevator, the periosteum is now stripped from the corresponding laminae to the articular processes. This is easily and quickly accomplished without injury or fraying of the periosteum with the clean start obtained, as just indicated. It is the ease and rapidity with which this can be done, and the relatively slight hemorrhage encountered as compared with other methods, which particularly recommends this procedure. With a few strokes of the chisel the opposite standing halves of the posterior spines are now broken off close to their bases, and deflected to the side, the periosteum being stripped back as on the opposite side. The next step consists in biting off with suitable forceps the remaining portion of the bases of the spinous processes and cutting through the laminae by any one of a number of suitable methods. The Hudson drill and a number of rongeur forceps of suitable size and shape will answer the purpose very well. After removal of the laminae, the spinal contents are dealt with as circumstances demand.

The closure of the wound is in no way complicated by the method of approach outlined. In fact, the clean cut wound edges showing the split halves of the spinous processes and the split supraspinous and interspinous ligaments offer good opportunity for accurate approximation. When the split spines are not too thick a stout, full-curved cutting needle can be passed directly through the corresponding halves, holding them in firm apposition. This is not necessary, however, as they will be held sufficiently firm by sutures taken through the periosteum or the dense ligamentous tissue above and below. A few intermediate sutures serve to unite the interspinous ligaments. The preservation of the spinous processes, so far as they have been split, though by no means an essential to firm union, may be regarded as a distinct advantage in securing greater firmness and accuracy in closure.

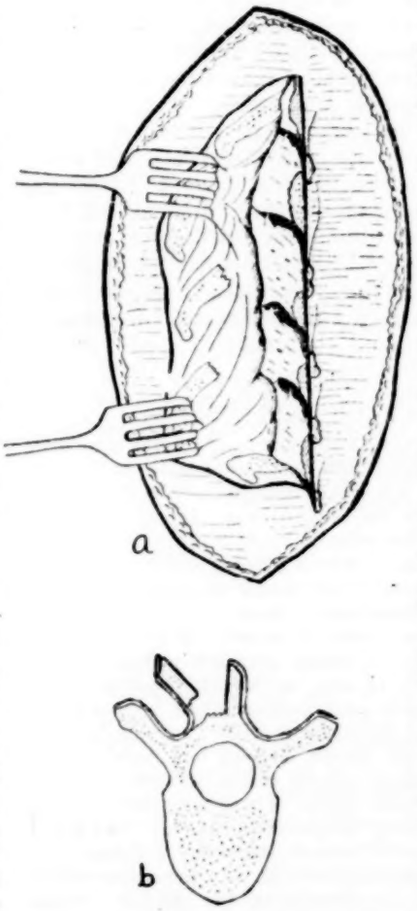

Fig. 1.—Posterior spinous processes (*a*) split in the middle; the left halves are deflected with the periosteum, leaving the denuded laminae on that side exposed; the right halves remain standing; *b*, cross section, showing splitting of posterior spinous process and denudation of lamina on left.

In one instance, when a laminectomy was done for fracture of the fifth cervical vertebra, death occurred some six weeks after operation from ascending kidney infection and trophic ulcers. The laminectomy wound had healed perfectly and the split halves of the

* Read before the Section on Orthopedic Surgery at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

spinous processes were firmly adherent to one another, though with a little force they could be separated with a snap, showing that bony union was well under way.

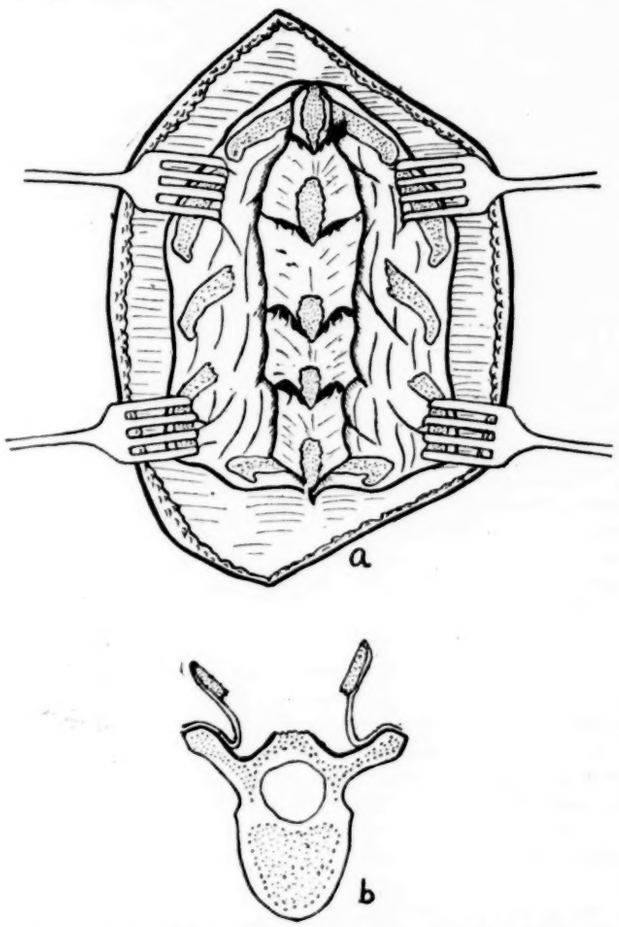

Fig. 2.—Broken spinous processes (*a*) deflected on both sides, exposing denuded laminae on both right and left; *b*, cross section.

The advantages of the method of approach, outlined above, are: (1) rapidily; (2) diminished trauma; (3) diminished hemorrhage, and (4) more accurate and firmer closure, by virtue of the union of the bony components.

In certain instances, after laminectomy for urgent cord pressure symptoms, it may be desirable to fix the spine by means of a tibial transplant immediately after decompression of the cord. After the usual operation practiced heretofore, in which the spinous processes are sacrificed, a bridging over of the laminectomized area by means of a tibial graft would be a hazardous proceeding, the graft receiving bony contact only above and below the laminectomized region. This hazard would naturally increase with the length of the laminectomized area. It may be regarded as a universally accepted fact that a bone graft has far better chances of becoming firmly united if it is in contact with numerous healthy bone surfaces. The method of approach, indicated above, by preserving the spinous processes and therefore retaining the usual number of bony contact points, paves the way for a successful combination of laminectomy and spine fixation by means of the bone graft. This plan was carried out in two cases, in both of which a diagnosis of vertebral tuberculosis had been made with urgent cord symptoms. After decompression of the cord, by laminectomy, performed according to the plan just outlined, several healthy spines above and below were split after the usual manner. The left halves were deflected while the right halves remained standing. A graft of sufficient length was then cut and put in place, bridging over the laminectomized area and finding anchorage above and below on the standing halves.

In both instances, primary union was obtained. In the first case, one with a middorsal lesion, the spine is held perfectly rigid, the graft fulfilling its mechanical function perfectly. In the second, a case of cervical Pott's disease with urgent symptoms, death occurred about four weeks after operation from an ascending urinary infection.

To be sure, indications calling for the employment of this combination of procedures will be encountered only rarely. Traction and recumbency in the hands of most orthopedic surgeons will prove adequate in the vast majority of cases, but in certain cases of Pott's disease, possibly also in some cases of fracture of the spine, a combination of the two will be found desirable. The experience in the cases just reported would indicate also that the method is feasible.

141 Wisconsin Street.

ABSTRACT OF DISCUSSION

DR. EDWIN W. RYERSON, Chicago: My experience with this operation is confined to one case, which I had recently, for fracture-dislocation of the spine. The procedure of Dr. Gaenslen was not exactly followed, in that I used a motor saw to split the spinous process, thereby causing less traumatism than when the chisel and mallet are used. The operation was nearly bloodless, much less hemorrhage being encountered than when the spinous processes are exposed and cut away by the rongeur. This procedure is the more valuable, as it gives an opportunity to put in a bone splint in cases of pressure on the spine caused by tuberculosis. These cases do not often require laminectomy; but when they do, one would hesitate to do a simple decompressive laminectomy, if there were no possibility of fixing the spine afterwards; but with one of the tibial splints, we may properly hesitate less to do it than in the past.

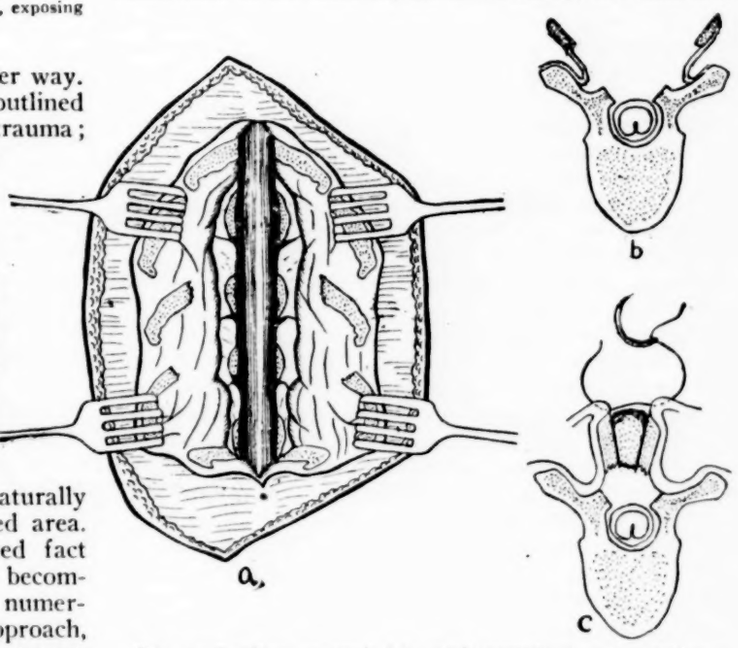

Fig. 3.—Laminae removed (*a*); cord exposed; *b*, cross section; *c*, cross section of vertebra in laminectomized area, showing bone graft in place and suture introduced.

OPERATIVE TREATMENT OF TUBERCULOSIS OF THE KNEE JOINT IN ADULTS *

ROBERT B. OSGOOD, M.D.
AND
EDWARD C. BULL, M.D.
BOSTON

Tuberculosis of the knee joint in adults differs in two important points from the same disease in children.

1. In children we have centers of growth in direct anatomic relation to the joint. Disturbance of these centers by the disease or by operative interference may seriously affect the ultimate length of the limb. This condition requires consideration and treatment.

2. In children there seems to be a more marked resistance to the disease than in adults, and cures with only slight disturbances of function often occur when persistent and continuous local fixation is combined with general treatment by heliotherapy and an antituberculous regimen.

In adults, the disease when once established, in our experience, may be said never to recover fully without operative interference of some form.

We realize that this is a sweeping and dogmatic statement, but we have yet to see a tuberculous disease of the knee joint in which the diagnosis has been conclusively established by means of tuberculin tests showing general and local knee joint reaction, by means of examination of tissue removed for purposes of microscopic study, or by means of positive guinea-pig inoculation of fluid removed by aspiration, gain a lasting recovery without operative interference.

DIAGNOSIS

We do not believe that the diagnosis of tuberculosis of the knee joint in adults can with certainty be made in the early stages of the disease from clinical examination alone. Several other monarticular affections may well be mistaken for it; a gonorrheal infection of subacute character; a syphilitic infection; a villous arthritis; a simple chronic synovitis of unknown origin, or a chronic traumatic arthritis.

We shall not attempt to indicate the important points in the differential diagnosis, but rather to emphasize the fact that in our opinion it cannot at times be made without the help of the laboratory tests enumerated in the foregoing. It is fair to say that any rather subacute affection of the knee joint, in which the subjective symptoms are often intermittent and which objectively is characterized by a persistent but variable change in the external contour of the joint and an atrophy of varying degree of calf and thigh, should be considered to represent tuberculosis of the knee joint unless there exists proof to the contrary.

We have become convinced that tuberculosis of the knee joint in adults is at times primary in the synovia. Our belief is based on the failure to find evidence of bone involvement by careful Roentgen-ray examination, by macroscopic examination at operation, by subsequent recovery as the result of arthrotomy and the injection of 4 per cent. iodoform and olive oil emulsion, and on the positive evidence of tuberculosis of the synovia by microscopic examination and the positive inoculation tests of guinea-pigs with the removed tissue or joint fluid.

TESTS

We have found the von Pirquet test to be of only negative help in excluding tuberculosis.

If the patient has no elevation of temperature and is placed on a two-hour chart, and if he reacts to a subcutaneous injection of Koch's old tuberculin by a slight or marked febrile rise and an increase in the local joint symptoms, as indicated by greater sensitiveness, added heat, or both, we believe an almost positive diagnosis of tuberculosis of the knee joint may be made. It is the practice of the clinic with which we are associated to begin with an injection of 0.1 mg. If no reaction occurs in two days, an injection of 1 mg. is given. If still no reaction, two days later an injection of .3 mg. is given, and if there remains no reaction to this and to a last injection of 5 mg., we consider the test to be negative.

We have no statistics as to the percentage of cases later proved positively to be tuberculosis in which this test fails to give any local or general reaction. We know that we sometimes fail to obtain it, but our impression is that the percentage of failures is very small.

ROENTGENOGRAPHIC EXAMINATION

The diagnosis by roentgenogram is often confirmatory, but opinion should in few cases be made conclusively from this evidence when considered alone. Tuberculosis is a destructive process, and when the bone is affected, loss of substance will often be shown; but when the disease is creeping in beneath the articular cartilage, it may not be evident in the roentgenogram. There is occasional lime salt deposit beneath the periosteum. Typically there is a hazy appearance of the articular surfaces.

The Wassermann reaction and the gonococcus complement fixation reaction are done as a routine in this clinic.

OPERATION

It is our belief that an operation should be contemplated as soon as the diagnosis has been made. It is often wise to defer the operation in a case in which there has been no fixation and in which the knee is in a more or less acute and irritable state. Such a patient should be put at once at complete rest and freedom from weight-bearing for perhaps a month, and when the acuteness of the disease has subsided, the appropriate operative procedure may be more safely executed, with less postoperative reaction.

Only two types of operation have for many years been considered in the clinic: the one conservative of function and representing little or no shock, attempting to cure the disease by keeping synovial surfaces apart and bathing them in an antiseptic oil; the other destructive of function, a major operation, attempting to cure the disease by destroying the joint and eliminating the synovial membrane and the red bone marrow.

When we believe that the tuberculous disease exists only in the synovia, we have been advising our adult patients to submit to an exploratory arthrotomy through a 3 inch lateral incision, and if no bony disease can be found at operation and the macroscopic findings are consistent with tuberculosis, we have been injecting a bland olive oil containing 4 per cent. of iodoform after the method of Brackett.[1] A consid-

* From the Orthopedic Department of the Massachusetts General Hospital.

* One patient was operated on at the age of 17; the others were 18 to 54 years of age, respectively.

* Read before the Section on Orthopedic Surgery at the Sixty-Eighth Annual Session of the American Medical Association, New York, June, 1917.

1. Brackett: Boston Med. and Surg. Jour., June 4, 1914, p. 873.

erable number of these patients (eight out of thirty) with tuberculosis of the knee have apparently been cured in his hands and able to regain function. For the technic of the operation, the reader is referred to Brackett's carefully written and excellently illustrated paper. Suffice it to say that from 1 to 5 ounces of the 4 per cent. iodoform oil are injected after the joint has been opened, the fluid evacuated, and the adhesions and pannus, if it exists, carefully separated. The deeper layers of the capsule and the synovia are closed by a continuous stitch from each end, a small opening being left in the middle for the nozzle of the glass syringe. A special double loop lock stitch is inserted and pulled tight about the nozzle, and the oil injected with considerable tension and the lock loop pulled home. Oil has been recovered from the joint eight weeks after the operation in an apparently unchanged condition.

TABLE 1.—CASES OF BONE AND JOINT TUBERCULOSIS TREATED FROM THE OUTPATIENT DEPARTMENT OF THE MASSACHUSETTS GENERAL HOSPITAL FOR TEN YEARS UP TO 1917

	No.
Total cases treated in outpatient department	239,867
Total cases treated in orthopedic department	20,079
Cases of bone and joint tuberculosis	1,336
Cases of tuberculosis of knee treated in outpatient department	266
Cases of tuberculosis of knee treated in orthopedic department	181

For the detailed after-treatment, the reader is again referred to Brackett's article. Complete fixation is never employed, though the patient bears weight in a split cast only after several months. The cast is removed every day for gentle passive movements. Sometimes two, and in a few cases three, injections are given if we can obtain no evidence of the involvement of the bone and the evidence of active synovial disease still exists.

If the evidence presented shows that disease of the bone exists, we have come to believe that excision is the procedure to be unqualifiedly advised. As we have said previously, if the disease is acute there should be an initial period of complete rest and fixation, but we have never seen permanently satisfactory function restored in a knee joint in which tuberculous disease has involved the bone. The disease often becomes quiescent under complete fixation, but subjected to use without protection, these apparently healed joints light up, and the disease advances, though the history may extend over a period of years.

We do not maintain that there never has existed a permanent cure of tuberculosis of the knee joint which has involved the bone, without an excision or an erasion or some procedure which obliterates the joint, but we do say that we have never seen one, and until we do we shall continue to advise for these cases excision as the method of choice.

Technic.—In discussing the technic of the operation for excision of the knee we shall describe that which after a period of years has seemed to us the more useful. The most careful two day or three day preparation of the skin is given. A tourniquet or an Esmarch is applied.

Incision.—A wide U-shaped incision is plotted by making three or four small skin scratches which will run at right angles to the U-shaped skin incision. Through these the main incision is made, and by matching the skin scratches, eventual nice apposition of the skin is made easy. The incision is carried down to the bone, from condyle to condyle, through the patellar tendon. The patella and flap are pulled upward, the crucial ligaments cut as the knee is flexed, and the whole joint cavity exposed. A quick, moderately complete dissection of the tuberculous tissue is carried out, and the patella, if badly diseased, is removed. If only its cartilage is affected, the articular surface is removed with a saw, and it is used later as a bone graft.

The really important judgment of the operation must be exercised in determining the amount of bone to be removed and the plane of the cuts. If paper patterns of the bones as shown in the lateral roentgenograms are cut before the operation and the amount of flexion to be desired because of the social conditions of the individual patient be determined, these patterns can be made to indicate in a fairly accurate way the planes of the saw cuts.

The determination of how much permanent flexion it is advisable to obtain for the patient is an important question. It is more than is generally thought to be wise. Brackett especially has called attention to the usefulness of even 45 degrees of permanent flexion in a man with a largely sedentary occupation. With a high sole and heel, walking is not as awkward as would be expected, and is more than offset by ease in sitting.

Our opinion is that in a man or woman with a sedentary occupation, from 35 to 40 degrees of flexion is the position of choice. If the work is to be chiefly ambulatory, from 15 to 20 degrees seems to offer the best functional position.

The bone is removed best with a miter saw, and after the slices have been taken from both femur and tibia, and perfect apposition in the desired position has been obtained, the posterior disease is removed down to the capsule.

We have become convinced that some method of internal fixation of the bone ends is greatly to be desired. Union is certainly quicker, postoperative pain is less, and early union favors early cure. Reference is here made to a study of the end-results of excision of the knee made by one of us.[2]

The method of internal fixation by means of bone plates and screws or by the Goddu aluminum wire clamp is satisfactory in many cases. The fact that in a considerable number of cases these plates or clamps had to be subsequently removed did not seem to delay speedy and satisfactory cure of the disease or early firm union. Two flat vanadium or plain steel plates have been most commonly used, placed laterally on the inner and outer sides. These plates may be quite accurately shaped before operation by cutting out a paper pattern of the anteroposterior roentgenogram, performing a paper excision, and fitting the plates to the lateral outlines. There are many cases, however, in which the atrophy of the bones is so considerable that even coarse-threaded wood screws get no grip and the plates offer little if any fixation. In such cases and in certain others (in order to try the method) we have been employing a suture of kangaroo

TABLE 2.—CASES OF BONE AND JOINT TUBERCULOSIS TREATED IN THE MASSACHUSETTS GENERAL HOSPITAL IN THE THREE YEARS PRECEDING 1917

	No.
Total cases treated in hospital	19,423
Cases of bone and joint tuberculosis	321
Cases of tuberculosis of knee treated in hospital	61
Cases of tuberculosis of knee treated in orthopedic ward	55

2. Osgood, R. B.: Boston Med. and Surg. Jour., July 24, 1913, p. 123.

tendon, which we believe to be useful. It may be called a "bundle knot tie," and is made with double kangaroo tendon for double strength, less likelihood of cutting, and greater length of tie. With a hand drill, in the end of which is a large eye, while the knee is flexed, a hole is bored straight through the femur from front to back, about 1.5 cm. above the cut surface. It may be necessary with a periosteum elevator to free the posterior capsule upward on the femur and downward on the tibia. With the knee flexed there is no danger of wounding the vessels if the drilling is carefully done. Through the eye of the projecting drill the two ends of a stout kangaroo tendon suture are threaded and pulled back. A second suture is now looped to the first and its two ends pulled through a symmetrical drill hole in the tibia. Next, a hole is drilled through the femur from side to side about 2 cm. above its cut surface, and a double kangaroo suture drawn through. Its looped end is looped to a fourth suture, which in turn is drawn through a corresponding hole in the upper end of the tibia. When the knee is extended and the apposition is accurate, the knots are tied tight and give a surprising amount of fixation. If only the joint surface of the patella has been removed, a bare bone bed is prepared for it and the sutures tied through and over it.

Smith-Peterson has suggested that the external and internal portions of the posterior capsule be tightly fastened together with kangaroo tendon when the knee is flexed. This is a reinforcing suture, and when the knee is extended, tends to keep the posterior bone surfaces from separating and to prevent the gap so often seen in the early subsequent roentgenogram as gravity tends to extend the leg. When all the sutures are tied, the skin and fat flap is closed with chromic gut in layers without drainage, and the skin with interrupted silk or silkworm-gut. The tourniquet is usually not removed until this has been done, and we do not as a rule find it necessary to tie any vessels. As soon as the bone ends are fixed by the plates or the sutures, an assistant devotes his entire attention to holding the limb in a position in which the close apposition will be maintained; and as soon as the dressing is in place a sterilized sheet iron or steel ham splint, bent previously to the determined angle, is placed beneath the limb, and with the assistant still holding, a plaster is applied from toes to groin. We hope for fairly firm callus in four weeks, we expect it in eight, and we are disappointed if the patient cannot bear some weight with artificial support in three months.

TABLE 3.—END-RESULTS IN SIXTY-NINE CASES OF TUBERCULOSIS OF THE KNEE IN ADULTS TREATED BY OIL ARTHROTOMY AND EXCISION; OPERATIONS DONE ON THE ORTHOPEDIC SERVICE OF THE MASSACHUSETTS GENERAL HOSPITAL, 1907-1917

	No.
Cases of oil arthrotomy	17
Cases of excision of the knee	52
Oil arthrotomy results:	
(a) Apparent cures	4
(b) Improved patients	4
(c) Patients not improved (1 died)	6
(d) Patients lost sight of	3
Means of internal fixation in excisions:	
(a) No internal fixation	1
(b) Bone plates, wire clamps or nails	30
(c) Kangaroo tendon	21
Secondary operations required:	
(a) Oil arthrotomy	4
(b) Excision	4
(c) Reexcision	4
(d) Amputation	7
(e) Removal of plates, wire clamps or nails	14
Number of excision cases with firm union	38
(a) In one month or less:	
Bone plates, etc.	6
Kangaroo tendon	0
(b) In one to two months:	
Bone plates, etc.	4
Kangaroo tendon	2
(c) Three months or more:	
Bone plates, etc.	17
Kangaroo tendon	9
	Months
Average time required for bony union in last 24 cases	9.2
(a) In cases with bone plates, nails, etc.	9.5
(b) In cases with kangaroo tendon	8.25
No record of eventual union (including amputations):	
	No.
(a) Bone plates, nails, etc.	4
(b) Kangaroo tendon	10
Mortality	1
	14
Failure to avert disease:	
(a) Oil arthrotomy (1 patient died)	6
(b) Excision	14
Failure to secure good functional result:	
(a) Oil arthrotomy	10
(b) Excision	14
Successful results as to cure of disease and usefulness of limb:	
(a) Oil arthrotomy	4
(b) Excision	36

The importance of function in converting fibrous union into bony should be emphasized, cases having occurred with fibrous union for many months which rather rapidly became rigid on beginning moderate function with plaster support.

The general health of the patient often greatly improves when this focus of disease is removed. The operation is not necessarily contraindicated in the presence of visceral disease elsewhere, and we have seen such lesions improve after an excision.

With the kangaroo bundle suture, even discharging sinus cases, if not too badly secondarily infected, may be induced to become solidly united and to overcome their disease.

The occurrence and results of the cases of tuberculosis of the knee joint in adults occurring in the orthopedic clinic of the Massachusetts General Hospital since 1907 are submitted in the accompanying tables.

CONCLUSIONS

1. Tuberculosis of the knee in adults is not fully cured without operative treatment.
2. Primary synovial tuberculosis of the knee in adults exists and is frequently improved or cured by inflation of the joint with iodoform oil.
3. We have seen no permanently satisfactory function restored in cases with bone involvement.
4. Excision of the knee is the method of choice in cases with bone involvement.
5. The position of choice is from 15 to 20 degrees' flexion for ambulatory vocations, and from 35 to 40 degrees' flexion for sedentary occupations.
6. Bone plates, where the bone is firm, and the kangaroo tendon "bundle tie," for conditions in which there is much atrophy, are valuable means of internal fixation.
7. Function is important for final bony union after excision.

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ABSTRACT OF DISCUSSION

DR. MELVIN S. HENDERSON, Rochester, Minn.: The operation of dissection of the knee joint has been carried on in the Mayo Clinic for years, and we consider it one of the best types of operation that we have. Taking it all in all, it has been satisfactory, although not all the results are good.

The statement was made in the paper that the authors have never seen a case of knee-joint tuberculosis in an adult cured. I can record two such cases in which the patients got well without operation. The cases were synovial in type, clearly proved to be that by guinea-pig inoculation. Both

patients have now been well for over three years. The treatment was by injection of iodoform emulsion in 10 per cent. glycerin, and not by fixation. The time of operation is important. These cases should not be operated on, but made quiescent. The age of the patient is also very important. Generally speaking, a man over 50 years of age is not a good subject for arthrodesis in tuberculosis; and many cases of this kind later require amputation. With regard to fixation, that is an important point. It depends on the social status of the patient, his occupation, etc.

I have this criticism to make of the technic described by Dr. Osgood: It appears to me to be too extensive a dissection. It seems to me important that the patient should not be subjected to a too extensive dissection, and that the operation should be quickly performed, with as little traumatism as possible. I think that some form of fixation is best, however. I had discarded it, but these statements seem to show that it is best. I have used merely one or two long nails driven through the skin below the line of incision, and up through the head and the condyles of the femur, and left projecting. At the end of three weeks I withdraw them.

In regard to the question of tuberculosis in adults, I would say that there must be a sharp differentiation between the synovial type, in which you can cure the condition by means of antiseptic solutions, and cases in which there is bone involvement, in which resection is indicated.

DR. JOHN RIDLON, Chicago: I should not like to have go to the general practitioners and general surgeons without a protest the statement of the apparent conviction on the part of the authors of this paper that cases of adult tuberculosis of the knee joint are not cured without operation; for I know that they are cured without operation, under prolonged immobilization and protection, the same as in children. I had the opportunity of showing such a case to Dr. Ryerson, who had doubted my statement, a year or two ago; and when he saw the patient and found how good the result was, he thought that it could not have been a case of tuberculosis. Maybe it was not; but the other knee had been excised at Johns Hopkins Hospital, the diagnosis having been concurred in by Bloodgood and Halsted of Baltimore, Gibney and Sayre of New York, and Fenger, Senn and McCarthy of Chicago.

DR. MARK H. ROGERS, Boston: This question of whether a knee recovers without operation or not in adult tuberculosis would seem to be an important one; for if such patients do recover to any great extent or in any great proportion, one does not want to do an excision in the early stage. On the other hand, if there is only probably about 1 per cent. or 2 per cent. of these cases that recover without operation, and it can be proved that they are tuberculosis, a delay in this type of case for three to five years, until there is bone destruction, will probably mean amputation and not improvement or cure. There has not yet been any record, so far as I know, of a cure by fixation. Men come to meetings and say that they have cured such cases by fixation, and that they were cases of tuberculosis; but they have not proved their results by iodoform injection. Their cure, so far as I know, has not yet been substantiated by published results; so until I see published some authentic results of careful observations, I shall still remain of the opinion that in order to get a cure, and a cure without waiting for four or five years and running the risk of having to do an amputation later, it is better to do an excision early, because there have been published authentic records of the absolute elimination of the disease by excision. If you have not obtained cures by the other methods, therefore, the earlier you do excision, the better. That is self evident. What you have to prove is that you can cure these patients without it. In a paper published last year I reviewed the records of over 100 cases. I found that, as far back as I could go, there was no record of a cure by any other method. In regard to the use of iodoform oil, I think it is too early yet to tell whether the patients so treated are cured. A good many supposedly cured cases light up later, and excision must be done. If you wait three or four years before excision, you have very poor tissue to do an excision on.

DR. JAMES ARCHER O'REILLY, St. Louis: In speaking of the diagnosis I do not think the paper mentioned the Wassermann test. That was probably an oversight on the part of the authors; because I do not believe that, with our knowledge of syphilis, any one would operate on the knee without having made a Wassermann test. In our clinic I could show several cases of similar conditions of the knee that got well under treatment without operation; but they were cases of syphilis, and not of tuberculosis. Therefore, I think it is very important that the Wassermann test be made.

DR. HENRY KELLER, New York: I think it is worth while to mention that there are two classes of tuberculosis, the bovine and the human, and that there is a difference between them. When the infection is due to the human tubercle bacillus, the cases are resistant to conservative treatment, whereas cases of the bovine tuberculosis will ultimately recover, although it takes a few years. I think, therefore, that it is worth while to find out, before resorting to any operative procedure, whether we are dealing with a bovine or a human tuberculosis. If I were sure that I was dealing with bovine infection I should not excise. Such cases should be treated by persistent and prolonged immobilization of the affected joint or joints. I wish to reiterate that these two types of tuberculosis should differ in their treatment, because their prognosis and ultimate results differ.

DR. ARTHUR STEINDLER, Iowa City, Iowa: I should like to ask Dr. Keller whether he has ever seen a case of adult tuberculosis of the bovine type, or has had any unimpeachable evidence of the existence of the bovine type in children.

DR. KELLER: Yes, sir; I have.

DR. WALTER G. STERN, Cleveland: I should like to ask Dr. Bull to explain his method of exploring the entire knee joint through "a simple lateral incision of 3 inches." I cannot see how such an incision will allow one to explore the top of the tibia, both condyles of the femur, etc., which is, of course, quite necessary in such an exploratory arthrotomy.

DR. E. H. ARNOLD, New Haven, Conn.: One thing that stands out prominently in the paper is that fixation works very well in these cases, if it supplements excision or any other procedure, which emphasizes the point made by Dr. Ridlon that fixation is, after all, one of the means of cure, and will cover the bovine cases and the Wassermann-test cases, because in all of these it will prove beneficial.

DR. F. J. GAENSLEN, Milwaukee, Wis.: I should like to ask the essayist to go into the question of the results obtained by the Brackett method. We are all interested; and although he suggested that enough time may not have elapsed to allow of formulating the results, we should like to have his impressions regarding the treatment. The speaker mentioned that two weeks after the injection of iodoform oil, he began passive movements. That, I think, will impress most of us as being contrary to the principles involved in the treatment of tuberculosis; and I should like to know how he justifies that proceeding. In speaking of the tuberculin test, he referred to the local or the general reaction. I think that we should have both in all cases. One of the chief difficulties that I have had is in immobilizing the knee securely during the time the plaster is applied, whether a nail is used or not. I think that the suggestion of using a posterior splint is excellent. No mention has been made of the method that Dr. Galloway described before the American Orthopedic Association at Pittsburgh, which consists in freshening the lateral surfaces of the tibia and having periosteal bone flaps from the femur come over the denuded surface, so as to have a more secure fixation. It impressed me as a valuable help in securing early and efficient bony union.

DR. EDWIN W. RYERSON, Chicago: I have said very often that I have never seen tuberculosis of the knee get well without operation. Dr. Ridlon referred to a case that he showed me last year. It was in a woman who, many years before, had had an undoubted tuberculosis of the knee joint, which had been operated on by excision and was cured. Years later she developed what was believed to be tuberculosis of the other knee joint; but this was not proved. As

I remember, Dr. Ridlon applied a plaster-of-Paris splint from the hip joint to the ankle joint, and the knee became well at the end of six months.

Dr. John Ridlon, Chicago: The knee tuberculosis in the right knee was diagnosed by Bloodgood of Johns Hopkins, and the patient was operated on there. The tuberculosis in the left knee developed while she was still in the hospital, and the diagnosis was then made by Bloodgood and Halsted. Wassermanns did not exist at that time; roentgenograms did not exist; rabbit inoculations did not exist. It was simply the opinion of the men in Baltimore, New York and Chicago whom I mentioned that it was tuberculosis of the left knee. It was treated for three or four years, and was not cured in six months.

Dr. Edwin W. Ryerson, Chicago: I think it is only fair to state that this case was not definitely proved to be one of knee joint tuberculosis. Dr. Henderson and others have said that the synovial form may be cured in adults without excision. Of course, everything is possible, and it may be that synovial tuberculosis may be cured without operation, but can a tuberculosis that is active in the bones of the adult knee joint be cured? Personally, I have seen no such case. It seems reasonable to believe that injections of antiseptic substances into the synovial surfaces may cure synovial tuberculosis. I have long hoped that it might do so, but I have seen many cases in my clinic in which we have injected different solutions without any result whatever, except to keep the patient wearing apparatus year after year, and then, at the end of many years, convinced that the knee was not going to get well, I have lost faith in this method of treatment. It has been an almost appalling surprise to me to find how extensive the disease is in many cases. The Central States Orthopedic Club saw in one city a large series of knee joints that had been treated conservatively for five to seven years. Not one patient was well, and all had had a stiff knee for all those years that they had been under treatment; and in my opinion, none of them stands a good chance of getting well without operation.

On the other hand, we have a simple and rapid method of producing bony ankylosis in the position best suited for the individual patient. We can reasonably expect to remove a large part of the tuberculous disease, and we can rapidly make the patient able to go about without apparatus. The majority (I will not say all) of the cases of joint tuberculosis in adults, as differentiated from synovial tuberculosis, will do better, I believe, as we see an increasing number of cases, with an excision done by a competent surgeon. Whether plates or other methods of bone fixation be deemed advisable is an open question. In my hands a long plaster-of-Paris spica from waist to toes has apparently made the patients comfortable and has promoted early union.

Dr. John Dunlop, Washington, D. C.: In reply to what Ryerson has said in regard to diagnosis, and also what Dr. Ridlon said of the early diagnosis of his case, I would say that I was Dr. Bloodgood's assistant for a year and saw a great many of the pathologic knees that were excised. After the possibility of a diagnosis of chronic joint disease became known, which it was not when I worked in the laboratory, they went over all those old excisions that they had made at Johns Hopkins and found that the diagnosis of atrophic arthritis was always being made in place of the diagnosis of tuberculosis. I believe that the case that Dr. Ridlon referred to was one of atrophic arthritis, although at that time all the men in Baltimore were making the diagnosis of tuberculosis in such cases.

Dr. Edward C. Bull, Boston: There seems to have been a misunderstanding. Our statement was that we have seen no recovery of adult tuberculosis of the knee without operation—meaning to include as an operation the injection of iodoform oil. At the time of the dissection of the involved tissues no effort is made to get the diseased portion out completely, but to get out most of the synovia and diseased bone. The Wassermann, gonococcus complement fixation and tuberculin tests are made as a routine; syphilis is therefore eliminated. As to the 3-inch incision in the oil arthrotomy operation, we grant that we cannot get a complete view through this; our observations are based on what we can see and feel, the fingers being run around to break up adhesions. Passive motion is employed very conservatively at first. The capsule is quite distended under the pressure of the oil, so there is little rubbing of the synovial surfaces, and certainly no force is used in the earlier employment of passive motion. Only a very few degrees of motion are employed at first.

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLE HAS BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION. W. A. PUCKNER, SECRETARY.

HALAZONE-ABBOTT.—Parasulphonedichloramidobenzoic acid.—$C_6H_4(SO_2NCl_2)COOH$-1:4.

Actions and Uses.—Halazone-Abbott is said to be a powerful disinfectant. It is said to act like chlorine, but to have the advantage of being stable in solid form. In the presence of alkali carbonate, borate and phosphate, Dakin and Dunham report that, in from thirty to sixty minutes, halazone in the proportion of 1:200,000 to 1:500,000 sterilized polluted water contaminated with such organisms as the *Bacillus coli, Bacillus typhosus, Bacillus paratyphosus* A and B, *Cholera vibrio* and *Bacillus dysenteriae.*

Dosage.—For the sterilization of water, 0.004 to 0.008 Gm. halazone, in the form of tablets containing sodium carbonate (or sodium borate) and sodium chloride, is added to 1 liter.

Manufactured by the Abbott Laboratories, Chicago. No U. S. patent or trademark.

Halazone Tablets-Abbott.—Each tablet contains halazone-Abbott 0.004 Gm., anhydrous sodium carbonate 0.004 Gm. and sodium chloride enough to make approximately 0.113 Gm.

Parasulphonedichloramidobenzoic acid was first prepared by H. D. Dakin and E. K. Dunham (Brit. Med. Jour., May 20, 1917, p. 682) under the name "Halazone." It is prepared (1) by oxidizing paratoluenesulphoneamid to parasulphoneamidobenzoic acid, and (2) chlorinating the latter.

Halazone-Abbott is a white powder having a strong odor of chlorine. It is slightly soluble in water and chloroform; insoluble in petroleum ether; soluble in glacial acetic acid, benzene, and with formation of the salt in alkali hydroxide solutions. It crystallizes in stout prisms from glacial acetic acid. The melting point of pure halazone is 213 C.

Halazone-Abbott liberates iodin from a neutral solution of sodium iodide and bromine from a neutral solution of sodium bromide.

If 15 Cc. of a saturated aqueous solution of anilin is treated with 0.05 Gm. of halazone-Abbott, the solution acquires a brownish-red color, which becomes deep blue upon supersaturation with ammonia water.

If 0.1 Gm. of halazone-Abbott is treated with a few drops of concentrated sulphuric acid, chlorine is evolved, but no blackening occurs (readily carbonizable matter).

About 0.150 Gm. of halazone-Abbott (or in the case of halazone tablets-Abbott, 30 tablets), accurately weighed, is dissolved in 100 Cc. of water and 10 Cc. of a 10 per cent. sodium hydroxide solution. Fifteen Cc. of a 10 per cent. potassium iodide solution is added, the mixture then acidified with acetic acid and titrated with tenth-normal sodium thiosulphate volumetric solution. (If the reagents used liberate iodin, the number of Cc. of tenth-normal sodium thiosulphate volumetric solution required for their decolorization should be deducted from the total volume used.) The available chlorine content of halazone-Abbott should not be higher than 26.2 per cent. or lower than 24 per cent. Each Cc. of tenth-normal thiosulphate volumetric solution is equivalent to 0.00177 Gm. of chlorine. The theoretical chlorine content of pure halazone is 26.2 per cent.

Smallpox and Vaccination in Turkey.—Smallpox is especially prevalent in the village communities. More than half the population of such places show the pock marks. The disease does not seem to have a very high mortality in Turkey, but it is the cause of inumerable cases of blindness among children, and in this respect ranks second only to gonorrheal infection. Vaccination is practiced in larger towns and cities and in the army. Only in the last instance it is systematically carried out.—A. R. Hoover, M.D., *The Survey.*

Military Medicine and Surgery

NOTES ON THE CARE OF THE CRIPPLED SOLDIER IN ENGLAND

F. C. KIDNER, U. S. A.

Captain, M. R. C., U. S. Army; Orthopedic Surgeon, Military Orthopedic Hospital, Shepherds Bush, London, England

DETROIT

The British War Office and the Royal Army Medical Corps early realized that the responsibility of the government to the wounded soldier did not end when he was discharged from hospital with his primary wounds healed, but with his usefulness more or less impaired. They appreciated that to give a man, with a badly united femur, contracted trench feet, or a paralyzed arm, a pension sufficient to keep him alive, and leave him to shift for himself, was economically unsound. They, therefore, undertook the study and perfection of methods to restore each man as nearly as possible to a state of activity and earning power which should approximate or excel that man's state before he went into the war.

The problems were and are huge ones. First to be considered were the difficulties of reconstructive surgery. Each case presented points for study which were outside the experience of the general surgeon, and had to be worked out under conditions entirely foreign to civil life. The Medical Corps of the Army had done wonders in saving life and limbs, but their skill most easily applied itself to the acute injuries. They were apt to assume permanent crippling because they had been used to seeing similar cases in civil life remain cripples. Second, the men themselves had a natural tendency to avoid prolonged hospital treatment with repeated surgical procedures. They were willing to be content with their disabilities and look forward to a life of ease, supported by their pension and helped by their friends. They could not bring themselves to see that such a life stretching ahead for many years must sooner or later become irksome. They could not foresee as did the authorities the growing discontent—first of the individual, and second of a community—which would be fostered if large numbers of healthy young men should be kept in idleness by loss of function in one or more members. The third difficulty to be considered was the provision of suitable hospitals for the accommodation of great numbers of men who must be kept under treatment for long periods of time if good results were to be obtained. Secondary to this difficulty was the provision of workshops in which men under the process of reconstruction could be taught to do useful things adapted to their ultimate loss of function. In short, the authorities were obliged to work out the details of a comprehensive scheme for the surgical, mental and physical treatment and training of enormous numbers of damaged men, of a class which we in America see occasionally in industrial surgery, in order that at the end of the war the country's man power might be as efficient, busy, and therefore happy, as ingenuity and persistence can make it. They felt that on the proper creation of such a scheme depended very largely the welfare of the nation for many years to come.

To the everlasting credit of the government, urged on by such men as Sir Alfred Keogh, the Surgeon-General, Col. Sir Robert Jones, the great orthopedic surgeon of Liverpool, Sir Walter Lawrence, King Manuel, and others, the problems just outlined have been taken up with great firmness and breadth of vision, and a splendid approach, which is constantly broadening in scope, has been made to the solution of the difficulties of rehabilitation of the crippled soldier.

It was due largely to the energy and courage of Sir Robert Jones that the War Office was made to see that surgery had not done its uttermost when a man's wounds were healed. He showed them how special training and aptitude for the work could create surgeons who would go much further than this, and acquire through long contact with chronic cases an ingenuity and patience which would enable them to take up the work where the general surgeon left off his brilliant accomplishments.[1] He showed that only men so trained could gain the best results. At first he was given his opportunity to prove his theories on only a small scale, and even then was handicapped by transfer to other duties of the men who worked under him. Gradually, however, his results began to speak for themselves, and he was given more and more a free hand. Growth was brought about by the increase in the number of beds under his control, sometimes by setting aside numbers of beds in general military hospitals and sometimes by the creation of complete reconstruction hospitals, until now there are in the British Isles something like 11,000 beds. This number is being increased rapidly and indefinitely, with a future minimum of 30,000.

It is my privilege to be stationed at the largest of these hospitals, the Military Orthopedic Hospital at Shepherds Bush, London, with its 1,100 beds and its permanent staff of five chiefs and the necessary assistants, under the orders of a major, responsible to the R. A. M. C., who acts as superintendent, disciplinarian, and business head. The hospital is divided into five services, each under the charge of one of the chiefs, and each with about 200 beds. The chiefs are all surgeons who in peace times had leanings toward orthopedics, and most of whom have served as army surgeons in the war. They have worked up to their positions through special aptitude for the work, and through periods of training in minor orthopedic positions under Sir Robert Jones. He it is who has general supervising charge of all the hospitals, and is the originator in all matters of policy. The hospital is divided into two blocks—the South and North. In the South Block are twelve wards of thirty-six beds each where the severe cases are kept. Each two wards have a head nurse and three or four nurses with voluntary women assistants. While waiting for operation or while convalescing, if able to be out of bed at all, men are transferred to the North Block, where they care for each other under the direction of two head and two or three ordinary nurses. At night the North Block is in charge of orderlies, who have certain disciplinary powers. There are also tents where many of the convalescents live. Discipline is roughly on army lines, but is complicated by the fact that it is against the law to punish any soldier in hospital except by confinement to bed, if necessary in a sort of prison ward, and by deprivation of privileges such as leave. On the whole, considering that most of the men are pretty healthy animals, they behave extremely well.

1. Of late, too, it has been realized that a great proportion of the wounded men need special orthopedic care from the very first, in order that the best ultimate results may be obtained.

The hospital is thoroughly equipped with a large massage department, a gymnasium, a hydrotherapeutic plant, and an electrical department. These are interdependent and ample. The men have regular schedule cards which admit them to any or all of these departments as ordered by their surgeon. Each department is in charge of an expert in the particular form of treatment who prescribes the details, which are carried out by large numbers of trained assistants. For instance, the massage department has about twenty masseuses or masseurs, one of whom is a blinded soldier. All departments are extraordinarily well run, especially the electrical, under Capt. W. R. Bristow, whose coil for diagnostic and treatment purposes far surpasses anything I have seen. When used under his direction, electrical treatment is of real value.

As an adjunct to these departments for special treatment are large workshops—woodworking, forge, splint making, repair shops, artificial limb shop, etc. In these large numbers of the patients work regularly. Their object is fourfold: First, to keep the men busy, and in that way to take their minds off their troubles. It is well known that the victim of long standing disability is apt to become depressed and the victim of his sympathizing friends. He does not do well physically because he is in a nonreceptive psychologic state. If he works he is usually happy. Second, work provides one of the best means for passive and active motion and massage. Third, work keeps a man at his trade, or goes far to teach him a new one. Fourth, the product of the shops supplies many needs of the hospital. In the English army no man in hospital can be forced to work, except for short periods as a prescription. He must work voluntarily. Here lies the great difficulty of the curative workshop—to get a man to go to them. It has not been fully solved, and there is much to do yet in making work interesting. Gradually the men are learning the value of work, and are taking it up more willingly. The best application of work to the individual is also a hard matter, for two reasons. First, a man with an injured hand constantly tends to save that hand, and use the good one, and thus gains nothing. Second, the tendency of the business authorities of the hospital is to get as great a product from the shops as possible. Therefore, the foremen are very apt to put patients on the job they can do best, regardless of its curative value. This, too, is being solved by the appointment of a medical supervisor, who prescribes the work, and by an increasing openmindedness on the part of the authorities.

The question of long residence in hospital is also a difficult one. It is appreciated that beds in a hospital which are costly should not be blocked by men who are waiting long periods for the regeneration of nerves or the subsidence of low grade infection. Yet if the men are allowed to leave the hospital, it is often difficult to get them back. The so-called Command Depots partially solve this problem. These depots are large camps where the men are kept under military discipline, doing what little work they can, but protected from the strain of active life. They care well for certain types of cases which need no nursing. Convalescent homes, too, care for large numbers. These are rather expensive and tend to hospitalization of the patient. The Command Depots furnish some of the details of treatment, such as baths, electricity, massage etc.

From this brief statement an idea of what has been accomplished toward the regeneration of cripples in England can be obtained, and the results are excellent. Surgeons are made especially fit to deal with the men, by a well organized course of continuous training, and the trained surgeons are kept at the job.

Hospitals have been acquired by the government for the treatment of this type of case only.

The men themselves are gradually being educated to an interest in the improvement of their own condition. Education is apparently the sole means for producing this result.

Military Orthopedic Hospital, Shepherds Bush, London, England.

THE VENEREAL DISEASES

THE TREATMENT OF GONORRHEA

GENERAL CONSIDERATIONS

(*Continued from page 1081*)

Every patient with acute urethritis should be ordered immediately to hospital for treatment. The earlier cases are seen, the better are the chances for rapid cure and the less the dangers of posterior urethritis and the complications of gonorrhea. With gonorrhea, as with syphilis, soldiers should be encouraged to report on the slightest suspicion of trouble, and those who have been exposed should be watched for a week for manifestation of the disease. On its appearance, treatment should be instituted immediately.

The patient should be given instructions, preferably printed, on the part he must take in the conduct of his case. In all cases he must be warned of the danger of carrying the disease to his eyes, and of gonorrheal ophthalmia; and of the necessity of washing his hands after touching his penis or anything contaminated with his pus.

At the first examination of every case of gonorrhea, the patient should be stripped in order to permit a general survey of his condition. Note should be made of the amount of discharge and of the condition of the glans and prepuce. The presence or absence of chancre and chancroid should be determined, and the testicles should be examined for a beginning epididymitis. Then the patient should be instructed to pass his urine into two glasses.

Two-Glass Test.—The two-glass test should be made at each examination for the purpose of determining: (*a*) if the posterior urethra has been affected; (*b*) the amount of pus secreted.

The urine passed during gonorrhea appears turbid from admixture with pus, and in it are little clumps or masses of desquamated epithelium. After standing, the pus settles to the bottom of the glass and a cloud of mucus appears floating above it. As the patient goes on toward recovery, the pus disappears, but the hypersecretion of mucus continues and occasions a cloudiness of the urine, giving it a mucilaginous appearance. After the mucus disappears, the "clap-shreds" persist for months, because isolated portions of mucous membrane are not covered with epithelium and are still secreting pus.

In the two-glass test, if the anterior urethra alone is affected, the first glass of urine will be cloudy and the second glass clear; but if the posterior urethra is involved both glasses will be turbid from the presence of pus. This is accounted for by the action of the "cut-off" muscle which forms a barrier between the anterior and posterior urethra. It prevents pus in the anterior urethra from flowing back into the bladder; so

that in anterior urethritis alone, the pus in front of the cut-off muscle is washed out in the first flow of urine, while the last of the urine will flow over a clean surface and remain clear; that is, the first glass will be turbid, the second clear. On the other hand, in posterior urethritis, the cut-off muscle holds back the pus, as it does the urine in the bladder, and the pus flows back into the bladder and renders all the urine turbid. When the urine in posterior urethritis is passed into two glasses, the second glass is turbid as well as the first. If it is desired to determine the condition of the anterior urethra in posterior urethritis, it can readily be done by irrigating the anterior urethra with saline solution and collecting the washings in a glass for inspection.

Microscopic Examination of Pus.—Microscopic examinations of pus are indispensable, not merely for the establishment of the diagnosis, but also for the observation of the progress and stage of the disease, for the selection of the appropriate treatment for the different stages, and finally for the purpose of determining whether the gonococci have been eliminated and the patient cured.

THE GONOCOCCUS

The gonococcus is coffeebean or kidney shaped, and usually found in diplococcus form, the flat or slightly indented side of the organisms facing each other. In pus from acute gonorrhea organisms are found both within and without the cells, crowded in masses in the leukocytes. The intracellular location of the organisms is of diagnostic importance, but is not so characteristically seen in pus from chronic cases.

The gonococcus is easily stained with methylene-blue or with most of the other anilin dyes. It is a gram-negative organism, and for the purpose of differentiation from other diplococci a Gram stain is necessary. It is quickly decolorized by Gram's method and can then be counterstained with safranin or other stain. The Gram stain does not furnish an absolutely characteristic differentiation of the gonococcus from all similar cocci, but in pus from the urethra or vagina, or from the eye in cases of acute conjunctivitis, it may be accepted as a reliable test.

For the absolute differentiation of the gonococcus, cultural methods are necessary.

In the prodromal stage when the discharge from the meatus is thin and scanty, microscopic examinations of smears shows quantities of desquamated cylindric epithelial cells and a moderate number of pus cells containing clumps of intracellular gonococci. In the ascending stage a large number of pus cells, many of them containing gonococci, and a number of free gonococci are to be seen. The stage of decline is indicated by the appearance of squamous epithelial cells, showing that the erosions have begun to cicatrize and have become covered with newly formed epithelium. Clumps of gonococci are also present, adhering to the epithelium. The pus cells have diminished in numbers and a smaller number of them contain gonococci. As the disease continues to improve, pus cells and gonococci disappear, and finally the discharge from the meatus is found to be composed only of squamous epithelium, mucus, and an occasional pus cell, without gonococci.

PROGNOSIS

The virulence of the gonococcus differs in different cases. It is often noted that when a person has chronic gonorrhea for months or years, the gonococci, when transplanted into the tissues of another person, are not capable of producing such virulent inflammatory symptoms as when taken from a fresh case. This attenuated virulence explains the fact that in such cases the period of incubation is comparatively long, the purulent discharge is scanty, and the cases often become chronic and result in prostatitis and stricture.

Another factor which influences the prognosis in gonorrhea is the state of the patient's general health. Gonorrhea acquired in persons affected with phthisis, or who are debilitated from any cause, is apt to run a subacute, but exceedingly protracted, course. The other causes which retard recovery may be grouped as follows: (*a*) complications, posterior urethritis, prostatitis, etc.; (*b*) reinfection from a urethral gland, seminal vesicle, prostate, etc.; (*c*) lack of rest; (*d*) alcoholic indulgence; (*e*) too vigorous treatment, especially injections which are too strong or too frequently repeated; (*f*) coitus.

ANTERIOR URETHRITIS

General Management.—Acute gonorrhea should be treated on the principles that apply to other severe acute inflammatory diseases: with rest, simple diet, removal of sources of irritation, and other such measures. The patient should have rest in bed as long as the urethritis is acute or as long as there are acute complications; no other measure contributes so much to prompt and uneventful recovery He should have a bland diet from which highly seasoned or rich foods are excluded; and in very acute cases a milk diet is best. He should drink an abundance of water—eight or ten glasses daily—and no other drink except milk. Alkalies and alkaline mineral waters should not be prescribed, because an acid reaction of the urine is the best safeguard against cystitis from bacteria which find their way into the bladder; and the acidity of the patient's urine will already be greatly reduced by his free use of milk and his abstinence from meat. Throughout the disease, the bowels should be kept open with aperients, and during the very acute stage the patient should have a saline cathartic every other morning.

Dressings for the purpose of catching the discharge and keeping it from the clothing are always necessary. The best form is a loose bag, such as that which can be made by cutting off the foot of a stocking, into the bottom of which gauze can be placed to catch the pus. The bag is suspended from a waist band. In this way a free flow of pus from the urethra is encouraged and retention prevented. Constriction of the penis by dressings wrapped around it should be carefully avoided, so that there may be no interference with the return circulation. A suspensory bandage should be worn when the patient is allowed to get up, in order to relieve the sensation of dragging on the spermatic cord and perhaps to lessen the danger of epididymitis.

Oil of sandalwood is soothing and curative and should be given during the acute stages, but not copaiba or cubebs; they are serviceable only in the declining stages of gonorrhea. Sandalwood oil should be administered in capsules — dose, 0.5 to 1 c.c. (8 to 15 minims) three times a day after food. It sometimes disagrees with the digestion or causes an intense pain in the back, and then should be discontinued.

Severe Acute Urethritis.—In very severe anterior urethritis with intense reaction, profuse discharge, and great swelling and edema, it is good judgment to wait for some subsidence of the symptoms before beginning

injections. In the meantime the parts should be kept clean; the penis held in hot water for fifteen minutes at a time every few hours, and hot sitz baths given every three or four hours to relieve distress. If pain on urination is very distressing, it may be relieved by an injection, five minutes before urination, of 1 c.c. of 1 per cent. solution of cocain hydrochlorate or B-eucain or novocain. Sandalwood oil diminishes the pain on urination in most cases, so that the use of a local anesthetic is not often necessary.

In the same way injections should not be used for anterior urethritis in the presence of acute complications in the posterior urethra or its adnexa.

Local Treatment.—In the ascending stage of acute urethritis and in other acute cases, which do not reach the intensity suggested in the preceding paragraphs, local treatment by injection may begin at once. For treatment in this stage and as long as gonococci remain, albuminates of silver salts, such as protargol, and argyrol, should be used. The treatment may be carried out by injections with a small hand syringe or by irrigations with an uninterrupted flow of solution from a large irrigator. Both methods of treatment have their advocates; either may be used effectively. But if irrigations are used, more care is required to avoid irritation or traumatism.

For hand injection, protargol or silvol are used in strengths of from 0.5 to 2 per cent. argyrol in strength of from 2 to 4 per cent. Injections should be given three or four times daily at intervals of four to eight hours. Before injections, the patient should wash out the urethra by urinating. For these injections, an acorn-tipped syringe should be used, the tip being firmly pressed into the meatus, and the penis held under moderate tension. The injections should always be given with the utmost gentleness, and if they produce distress, their strength should be reduced. In order to be effective, a sufficient quantity of fluid must be injected to distend the anterior urethra so that a syringe of at least 15 c.c. capacity should be used. The solution must be held in the urethra for at least five minutes —better, ten.

The same treatment may be carried out by copious irrigations or urethral lavage, using a glass irrigator filled with the fluid and suspended at a height of 2 to 4 feet above the penis. The solutions used for irrigation are less concentrated than those for injection. The solutions in common use are protargol or argyrol in the strength of 1:1,000, or permanganate of potash in the strength of 1:3,000. The irrigations should be given at temperatures of from 110 to 115 F.—as hot as can comfortably be borne—and be repeated as often as four times in twenty-four hours.

Technic of Irrigations.—The patient should sit well forward on the chair and lean backward, resting his shoulders against the back of the chair. He should hold a small basin to catch the overflow of the irrigation. The irrigator tip is pressed against the meatus and the anterior urethra distended with fluid. Then by a short release of pressure of the tip a return flow is allowed. This is repeated until thorough irrigation of the anterior urethra has been obtained. If it is desired to irrigate the posterior urethra, the anterior urethra should first be washed out. Then the tip should be firmly pressed against the meatus and the anterior urethra dilated with fluid. The patient is then instructed to take a long breath and to try to urinate; this releases the cut-off muscle and the irrigating fluid flows into the bladder. The bladder is allowed to fill with fluid, but should not be distended beyond the point of comfort. After the bladder is filled, the patient empties it by urination.

The advantages of treatment by irrigations are that the surgeon is sure that the treatment is correctly applied; the discharge is rapidly reduced to a minimum; and posterior urethritis occurs less frequently than under the treatment by injections.

Stage of Decline of Gonorrhea.—Under the above methods of treatment, the acute symptoms of gonorrhea promptly disappear. If, however, treatment be discontinued at this point, even though the discharge has ceased and only a few shreds remain in the urine, a relapse is certain to occur in from two to three weeks, since a few gonococci have been left in the tissues and extensive reinfection occurs.

In about three weeks, in cases which run a favorable course under the treatment with silver albuminates, the discharge becomes watery and scant. Microscopic examination shows few or no gonococci, but many newly formed desquamated epithelial cells. The urine in the first glass is clear or slightly turbid, but contains many long mucous filaments. When the case has reached this stage, the task remains of curing the existing postgonorrheal lesions. These consist of catarrhal inflammation of the mucous membrane, erosions, periglandular infiltrations, and infiltrations of the submucous tissues. Since the albuminates of silver have the purpose only of destroying the gonococci, but exert no effect on the inflammatory processes, it is necessary at this time to treat the existing catarrh of the mucous membrane by astringent remedies.

The following are appropriate preparations for this purpose:

	gm. or c.c.	
Zinc sulphate	.60	gr. xii
Resorcin	1.25	gr. xxiv
Water	100.00	ʒ iv
or		
Zinc sulphate	.20 to .60	gr. iv to xii
Phenol	.20	gr. iv
Water	100.00	ʒ iv
or		
Zinc sulphate	.40	gr. x
Lead acetate	.80	gr. xx
Water	100.00	ʒ iv
or		
Zinc permanganate	.05 to .10	gr. i to gr. ii
Water	100.00	ʒ iv

Injections of these solutions are given once or twice daily. They are not, however, bactericidal, and should be supplemented by injections of silver albuminate, in order to get rid of the few remaining gonococci. The latter are also given twice daily, alternating with the astringent injections.

It may be repeated that these astringent injections are indicated only in the terminal stages of gonorrhea, and that they should be given neither in acute gonorrhea nor in the presence of acute complications in the posterior urethra.

Under such astringent treatment, the discharge soon stops, and the urine becomes clear and free from pus; but numerous small clap-shreds persist. When this stage is reached, a provocative irrigation of a 1:4,000 solution of silver nitrate should be given. If gonococci are still present, this causes the return of a profuse discharge, in which gonococci will be found. The occurrence of such a discharge after provocative injection necessitates a return to treatment for acute urethritis. When no relapse follows the silver nitrate irrigation and the urine is clear, but contains many shreds, dilatation of the urethra not oftener than every

five days is necessary to get rid of the remaining lesions and bring the urethra back to normal. The dilatations are made with a sound large enough to distend the urethra, and if the meatus is too small to admit a 28 or 30 French sound, a meatotomy should be done. Gentle massage of the urethra should be practiced with the finger over the sound while it is lying in the urethra.

Each dilatation should be followed by a copious irrigation with a 1:10,000 silver nitrate solution, and an irrigation with the same solution should also be made on days when the dilatation is not done. A hand injection of one of the astringents may be used once or twice a day in conjunction with the irrigations.

Treatment by dilatation of the urethra and irrigation should be continued until the shreds have disappeared from the urine. In most cases this is eventually accomplished, but occasionally persons will be observed who do not respond to this treatment; these are likely to improve rapidly under a daily irrigation of potassium permanganate.

It is possible to treat gonorrhea too long, and to cause the discharge to persist by the simple irritation of injections. In such cases, there will be a secretion free from gonococci, which on squeezing will appear at the meatus as a small, transparent, glycerin-like drop, and which will cause sticking together of the meatus in the morning. In cases manifesting this condition, it is advisable to stop treatment and to allow the irritation to subside. In consequence the mucous discharge will often disappear spontaneously.

After five or six weeks of treatment, if the discharge has stopped and the urine is free from filaments, and the prostate and vesicles are not involved, treatment may be suspended. But the patient should be examined at frequent intervals for two weeks more. Cultures can advantageously be made at this time since a growth of the gonococci may be obtained even when none are seen in stained specimens. As a last precaution before discharging the patient, the urethra should be examined with a bougie à boule or urethroscope, and the condition of the prostate and seminal vesicles should be investigated to make sure that these organs are free from disease.

POSTERIOR URETHRITIS

Posterior urethritis develops as a rule after acute anterior urethritis has become subacute, that is, from the second to fourth week of infection, or later. It occurs in 40 to 80 per cent. of cases. Its occurrence is usually due to the spontaneous spread of the infection from the anterior urethra; but not infrequently the tendency to its spread is increased by a too vigorous local treatment, particularly by injudicious instrumentation. It may occur as a very severe process, or more frequently as a subacute one. In addition to the urethra, it is likely to involve the prostate and the base of the bladder, and frequently it spreads to the seminal vesicles and the epididymis.

Posterior urethritis will not escape detection, if the two-glass test is done daily as a routine measure on each patient. A turbidity of both glasses, when due to pus and not to phosphates, denotes involvement of the posterior urethra.

Severe posterior urethritis demands complete rest in bed and measures directed to the relief of the distressing symptoms. All local treatment of the urethra should be suspended. The nearer the diet approaches to a liquid or milk diet, the better. Abundant water should be taken, but diuretics should not be used, because they cause the too frequent evacuation of an already overtaxed bladder. Saline cathartics should be given every other day to reduce congestion in the pelvis. For the relief of tenesmus and pain, sitz baths of half an hour's duration, repeated several times a day, are useful. Alkalies, which favor the growth of bacteria in the bladder by rendering the urine alkaline, are contraindicated, as they are in acute urethritis. Sandalwood oil is not only curative, but soothing and gives relief in many cases. In the severe cases morphin should be given to relieve tenesmus and desire to urinate. It is best to give it in these cases in suppositories.

When other methods fail to relieve tenesmus and pain, remarkable relief is occasionally obtained by the instillation of a few drops—about ten—of a 1:500 to 1:100 solution of silver nitrate through a soft catheter or a deep urethral syringe. In the beginning this should not be stronger than 1:500, and it should not be used oftener than every two or three days. This instillation of silver nitrate in acute cases of posterior urethritis should be a last resort. It is contrary to the principles which should usually control the treatment of such cases, namely, not to introduce instruments during acute urethritis.

As a rule, the acute stage of posterior urethritis disappears promptly, and the cases pass into the condition of mild posterior urethritis, and then should be treated as such.

Treatment of Mild Posterior Urethritis.—In subacute posterior urethritis, treatment is given on principles similar to those applicable to subacute anterior urethritis. Solutions are applied to the surface, either by the injection of small quantities of concentrated solutions or by irrigations of copious quantities of dilute solutions.

In the first method, a small soft rubber catheter is introduced just beyond the cut-off muscle, and by means of a small urethral syringe about ten drops of 1:500 to 1:100 solution of silver nitrate are introduced into the posterior urethra. This is to be repeated at intervals of one or two days according to the tolerance of the case. In order to prevent immediate precipitation of the silver by the urine, the injection should be made with the bladder empty.

Irrigations are particularly applicable to the treatment of posterior urethritis. These may be given with a 100 c.c. hand syringe having an acorn tip, but they are preferably given through a gravity irrigator elevated five to six feet above the penis, according to the technic already described for irrigation. For posterior irrigations, protargol in the strength of 1:1,000 to 1:250, or silver nitrate 1:10,000 are used. Less effective, but still useful in some cases, is potassium permanganate, 1:3,000.

There is room for personal preference in selecting instillations or irrigations for the treatment of posterior urethritis. As a general statement, it may be said that copious irrigations are likely to be most useful in recent cases which are free from pain and other acute symptoms, but show rather an abundant purulent secretion; while instillations are more serviceable after the urine has cleared and only shreds remain.

As a rule, posterior urethritis is accompanied by complications in adjacent structures, and persistence depends on reinfection from these structures. Successful treatment, therefore, depends on the treatment of the complications.

(To be continued)

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SATURDAY, OCTOBER 6, 1917

THE OUTPUT OF BASES AFTER INTAKE OF ACID

The introduction of a nonoxidizable acid, such as the ordinary mineral acids, into the organism must resemble in considerable degree that condition which may result in acidosis. In order to retain its normal capacities, the body must neutralize the foreign acid and get rid of it in some way. Organic acids may be eliminated as such to a certain degree; but any noteworthy accumulation of acid products demands some compensatory elimination of base. Among the ordinarily available resources are the fixed alkalies and alkali earths of the body, as well as ammonia that is "deflected" from the usual course of nitrogenous metabolism. Severe acidosis invariably involves a depletion of the alkali reserves of the body.[1] It is well known that an increased output of ammonia attends the appearance of considerable quantities of acid in the organism, whether they are introduced experimentally or arise in metabolism.

The extent to which other bases may be eliminated is not so well known, owing, doubtless, to the greater difficulty in the analytic estimation of their output. Stehle[2] has lately undertaken a study of this question at the University of Pennsylvania. He found that administration of hydrochloric acid by mouth to dogs causes an increased excretion of calcium and magnesium as well as of sodium and potassium. But in the case of the latter pair — the alkalies — a subsequent compensatory retention makes the loss apparent rather than real. The ammonia is, however, the great factor in neutralizing acid administered in this way.

Stehle remarks that if an analogous condition holds in human diabetes, the resulting calcium loss may be something to take into consideration in the treatment of diabetic patients in whom the excretion of beta-hydroxybutyric acid has reached a significant figure. He cites an illustrative case in which there was an excretion of more than 5 kg. of this substance in the last 160 days of the patient's life. This is equivalent to 66 gm. of calcium. Such an amount, says Stehle, does not seem large when the whole calcium content of the body is considered; but it is unknown to what extent the calcium of the body must be considered inert. If the quantity is large, then 66 gm. may be quite a significant loss. The balance of calcium in diabetics is usually reported to be negative.

With the possible function of calcium as a neutralizer of acid in mind, it has been maintained that the storage of calcium is dependent on a suitable supply of alkali to the organism. Thus the assertion has been made that the addition of alkali carbonate to the food of children may change a negative calcium balance to a positive one.[3] This was believed to be due to the neutralization, by the alkali, of the acids formed in metabolism and also to a prevention of the formation in the alimentary tract of insoluble calcium soaps which cannot be utilized. The alkali was supposed to render unnecessary the withdrawal of calcium. According to a recent study by Givens and Mendel[4] at Yale University, administration of base produced no significant effect on the balance of nitrogen, calcium, magnesium and phosphorus, in dogs; nor did it decrease the urinary output of calcium in a human diabetic.

1. The Newer Conception of Acidosis, editorial, The Journal A. M. A., Aug. 25, 1917, p. 646.
2. Stehle, R. L.: A Study of the Effect of Hydrochloric Acid on the Mineral Excretion of Dogs, Jour. Biol. Chem., 1917, **31**, 461.
3. Dubois, M., and Stolte, K.: Jahrb. Kinderh., 1913, **77**, 21.
4. Givens, M. H., and Mendel, L. B.: Studies in Calcium and Magnesium Metabolism, I, The Effects of Base and Acid, Jour. Biol. Chem., 1917, **31**, 421.

CANNING WHAT YOU CAN

Since Aesop wrote the fable of the ant and the grasshopper, and possibly before that time, it has been considered the act of the wise to store in times of ease and plenty for use in times of stress and poverty. When a nation is at war, production of many of the commodities of peace time of course diminishes. Therefore, one of the first considerations of the United States Food Administration is in the direction of food conservation and preservation — storing — the latter through canning, drying and other approved methods. On account of the increased production of food during the warm season of the year, it is necessary to save the surplus of perishables "to provide variety for the winter diet, lessen the expenditure for food, and help to simplify the growing problem of transportation."

Probably the most advantageous method of preserving foods is by canning, as this method retains the original form, color, flavor and texture of fruits and vegetables to a greater degree than do other means of preservation. In addition, such preserved foods require less preparation before serving. Of course, the initial cost of containers increases the price of canned foods over the expense of drying, brining or curing, but it is likely that the advantages of the canning method—and this includes putting up in jars, bottles, etc.—outweigh the disadvantage of the initial increased cost of containers, especially as most housewives use the same containers from year to year.

It is interesting to look back into the history and development of the canning industry. Near the end of the eighteenth century, the French government enacted, among other military measures, the offering of a bounty of 12,000 francs for an improved method of preserving foods.[1] The bounty, generous for that time, attracted many capable men. Nicholas Appert, an expert confectioner, brewer, distiller, and chef, worked on the problem from 1795 until 1804 before he attained his first success. At that time he found that by heating the product and then hermetically sealing the container, the food could be well preserved. In 1810 he published his results. He was awarded the prize, and is generally recognized as the discoverer of canning. By 1820 this method was being used in a commercial way. According to Appert's description, he packed the product in glass bottles, added sufficient water to cover, inserted the corks, and then placed the bottles in the water bath, heating them gradually for varying lengths of time, depending on the character of the food. He used glass exclusively.

In 1807 a Mr. Saddington in England had described a method of preserving essentially similar to that of Appert, but he did not claim to be the originator of the method, having obtained it while traveling in France. It was not generally understood why foods kept when heated by this method, but it was customary to ascribe the results to the exclusion of outside air after applying sufficient heat to the food. The French government appointed Guy Lussac to investigate the cause, and he reported that spoiling was a series of oxidation changes which could be prevented by the exclusion of outside air. It was only later that with the advent of bacteriology the true explanation came forth. And the honor for discovering most of the fundamental principles of bacteriology belongs also to the French master, Pasteur.

According to Bitting and Bitting, commercial canning on a small scale was begun in this country in New York in 1819, and in Boston in 1820, salmon, lobsters and oysters being packed in the former, and fruits in the latter. The firm of Underwood in Boston, which did the work at that time, has been in continuous operation since. The first cannery in Baltimore was opened in 1840, and the sardine industry at Eastport, Maine, in 1841. Appert used the glass bottle for his experiments, as did Saddington; but in 1810, Peter Durand in England took out a blanket patent on containers of almost every known material, and specifically mentioned tin. He is therefore known as the "father of the tin can." The early packers paid most attention to the preservation of fish and meat products, and the canning of fruits and vegetables was incidental. Today, or just previous to the onset of the war, there were packed annually in the United States some 3,000,000,000 cans of food, representing products of approximately 3,000 factories, and valued at millions of dollars.

Canning is the most widely used means of preserving large quantities of food, and is probably the best understood of all preserving methods. When properly performed, it yields food which is safe and hygienic and which has lost none of its palatability or nourishing qualities. In this way every householder may aid the food conservation bureau by economizing, with distinct advantage and with no detriment to himself.

1. Bitting, A. W., and Bitting, K. G.: Canning and How to Use Canned Foods, National Canners' Association, Washington, D. C., p. 11

WAR DIET AND METABOLISM

There seems to be little doubt that during the early period of the European war, when it seemed necessary to institute a strict economy in the distribution of food to the peoples of the countries involved, the food requirement of the population was underestimated for the physical work to be accomplished and underestimated for those who were in the period of adolescence; furthermore, that the enforcement of the food laws was placed in the hands of farmers, middlemen, and politicians, who mismanaged the situation.[1] The economy of food in the body is, in the first instance, a problem related to the need of energy and the metabolism of the offered nutrients. Even at complete rest the human organism requires energy for the performance of vital functions such as the activities of the heart and the work of the circulation and respiration, not to mention minor items of energy exchange which express themselves as tonus. Much more energy is called for as soon as external work is being done. If the food intake is inadequate it is inevitable, therefore, that the body should give up some of its stored nutrients—glycogen, fats, and last of all proteins—to maintain the performances just outlined. There can be no compromise in the matter of energy. The laws of the conservation of energy are inevitable in their incidence.

Two competent German physiologists, Professor Loewy and Zuntz[2] of Berlin, have related in a paper that has recently come to notice in this country how the early German food proclamations worked. They observed as the result of the restricted war diet that the majority of the strong and healthy men lost from 6 to 8 kg. (10 to 12 per cent.) of their earlier body weight. After the decrease a constant weight was established. The question is raised as to the cause of this decreased and then constant weight, and whether there is a relation to a lessened consumption of energy. With two people there was found a plainly evident reduction in metabolism and the decrease in consumption of energy was more marked than the accompanying loss of weight. An explanation of the low

1. Lusk, G.: The Science of Nutrition, Philadelphia, 1917, p. 556.
2. Loewy, A., and Zuntz, N.: The Influence of the War Diet on the Metabolism, Berl. klin. Wchnschr., 1916, **53** 825.

equilibrium given is that with the decrease in body weight there is a relatively greater decrease of the active cell substance.

Evidently, any procedure which lessens the quantity of metabolizing tissues in the body may decrease the amount of energy required. An emaciated individual who is in good health will invariably exhibit a diminished metabolism. Lusk states that in starvation the fall in metabolism reaches greater proportions than does the fall in the mass of protoplasmic tissue. Thus there seems to be a specific reduction in metabolism coincident with undernutrition. But who will say that in final analysis the best measure of human performance is to be found in the most economical use of food? The newly organized Food Administration of the United States fortified by an advisory board on alimentation composed of recognized students of nutrition has not advocated that our people shall go without needed food. Indeed, we are urged to "eat wisely and well," but to choose our foods in such a way that those most needed across the seas, especially the most concentrated foods, such as wheat, beef, pork, dairy products, and sugar may be saved for export. We have for our own use an abundance of foodstuffs of other kinds—the perishables, fish, corn and other cereals—and we are asked so far as possible to substitute these for those other products of greater use abroad. The assistant secretary of agriculture has well stated the needs of the time. In time of war, he remarked, as in time of peace it is not only important, but essential that the people be well fed. Victory does not depend alone on guns and soldiers; it depends as well on the efficiency of every man, woman, and child back of the firing line. To maintain this efficiency there must be enough food and it must be so cooked and so combined as to be both palatable and nourishing. The war must be won in the kitchens and on the dining tables of America as well as in the trenches.

HUMIDITY AND HUMIDIFIERS

Our ideas respecting the physiologic action of atmospheric conditions and as to what constitutes an ideal atmospheric environment have been greatly changed in recent years. Those features of general bodily discomfort which betray themselves by unmistakable sensations—malaise, sleepiness, the flushed face, headache, disinclination to think or act, general debility—are no longer ascribed to chemical vitiation of the air, but rather to certain physical peculiarities. Carbon dioxid and unidentified organic respiratory products are at present not charged with responsibility for the unquestionably deleterious effects of certain atmospheres. Today we are inclined rather to say that "bad air" is too warm, too moist and too still. As Lee[1] has remarked, if it has not these physical features it is not harmful.

Lee has summarized the evidence of modern investigation as to what constitutes a favorable atmospheric environment by saying that when an existing external temperature is fairly comfortable to the body, an elevation of it, especially when such an elevation is accompanied by an increase of humidity, is deleterious, and the deleterious effects are more pronounced when the air is stagnant. Deleterious effects resulting from such a combination of atmospheric conditions may be obviated in some degree if the air next to the skin be put into motion, but a more effective antidote is a reduction in the temperature of the air, and this may be assisted by a reduction in its humidity. All experimentation and observation demonstrate that a moderately cool and moderately dry air in motion constitutes the most physiologically helpful aerial envelope of the body. The customary figure of 70 F. (approximately 21 C.) for the atmosphere in which most persons engage in the ordinary occupations of the living room of a dwelling, is too high; a range from 65 to 68 F. (approximately 18 to 20 C.) with not over 50 per cent. relative humidity, is undoubtedly better, but even such temperatures are too high when much physical activity occurs.

The question as to whether the atmosphere can ever become too dry for comfort or physiologic well being has not yet been satisfactorily answered. The comfort contributed by a dry atmosphere in contrast to a humid one in warm weather is unmistakable. In cold weather the moisture may be largely precipitated from the air so that it becomes extremely dry when it enters houses. This has led to the desire and the practice to moisten such air. This may be done, to some extent, by heating water in large open vessels. It has been pointed out,[2] however, that for efficient moistening of the air, either a very large evaporating surface or steam jets are required. The small open vessels or saucers on which some people rely, even when located in the air passages of a hot air furnace, have only an infinitesimal influence.

An ordinary medium-sized house requires the evaporation of not less than ten gallons of water per twenty-four hours, and much more than this according to some writers, to afford suitable conditions of moisture in cold dry weather. Various devices have been suggested and are being marketed to produce humidity in the heated house in winter months. Dean Lyon[3] of the University of Minnesota has tested four types of radiator humidifiers now on the market. The most efficient of these have evaporated no more than 1,248 grams of water (a little more than two pounds) in a day per each horizontal foot of radiator occupied by

1. Lee, F. S.: Recent Progress in our Knowledge of the Physiological Action of Atmospheric Conditions, Science, Aug. 11, 1916, **44**, 183.

2. See, for example, Fisher, I., and Fisk, E. L.: How to Live, New York, 1915.

3. Lyon, E. P.: Tests of Radiator Humidifiers, Science, Sept. 14, 1917, **46**, 262.

the apparatus. Lyon, therefore, states that, under the conditions of our northern winters, it will be seen that these radiator devices are practically worthless. Using the sling psychrometer he was never able to detect an increase of humidity from the use of any of them. Indeed, the best of them is no more efficient as an air moistener than one human being. The average evaporation from lungs and skin of a large laboratory class in subzero weather, and about 70 degrees F. inside temperature, was nearly two ounces per hour per person, or about 1,200 grams a day. Such information is valuable at this season when the question of maintaining humidity in house air always recurs.

THE FOOD REQUIREMENT IN INFANCY

A considerable number of data are now available respecting the energy requirement of the young infant at complete rest.[1] These establish the so-called metabolism of the individual, that is, the energy transformed in a condition of muscular repose and when absorption of food from the digestive tract is not going on. In the case of new-born infants it does not exceed forty-eight calories per kilogram of body weight per day. Children at later ages, between 2 months and 1 year, manifest a heat production equivalent to about sixty calories per kilogram per day, during sleep. Valuable as this information is, it does not suffice by itself to establish a practical basis for estimating the food requirement of the child under conditions of its customary routine. Something more is necessary than an allowance of thirty calories per pound to keep a baby alive. As Dr. Mary S. Rose expresses it, babies cannot lie quietly all the time. If they are to grow and acquire strong muscles they must have exercise, which they get by crying, kicking, pounding with their fists, and other movements. This means work, requiring a further supply of energy. A baby 5 months old has been shown to double his energy expenditure by the effort of crying. Active children really work as hard as any adult manual laborer.[2] Furthermore, a not inconsiderable quota of energy is required to meet the demands of growth of the young child.

For calculating the energy requirement in infant feeding at the present time it is customary to accept as standards the figures furnished by Rubner and Heubner as the outcome of their observations in this field. Heubner maintains that an average normal infant requires per twenty-four hours, one hundred calories per kilogram of body weight during the first three months of life, ninety calories during the second three months, and eighty or less calories during the last half of the first year of life. The greatest factor of uncertainty in such figures lies in the difficulty furnished by the unknown degree of muscular activity of an infant in the course of the day. The essential facts could be established, of course, by studies of infants in a respiratory chamber where the actual metabolism could be followed over sufficiently long periods of varied infantile activity to afford evidence of the real performance of the individuals. Experiments of this sort are attended with great difficulty in performance and inconvenience to the investigator. Dr. Talbot of Boston is to be congratulated, therefore, on his success in measuring the heat output in infants at the Nutrition Laboratory of the Carnegie Institution of Washington over successive periods so that the effects of both absolute quiet and characteristic infantile activity could be independently established and compared.[3] In babies of 2 and 6 months of age, respectively, their muscular activity increased their metabolism 67 to 70 per cent. over the basal metabolism at rest.

Talbot suggests that a rough estimate of the caloric requirements of a normal infant may be made by adding the calories used up by muscular activity to the basal metabolism. If the infant is very quiet, 15 per cent. should be added, if normally active 25 per cent., and if extremely active, about 40 per cent. To the result add 15 per cent. for energy lost in the excreta and 20 per cent for growth. Lusk[4] believes that Heubner's figure of one hundred calories per kilogram of body weight during the first month of the infant's nutrition is in excess of the requirement. He states that probably eighty calories per kilogram will be found to suffice during the whole of the first year, and that the physician should remember very definitely the lower limits. Talbot's findings tend to argue for the higher rather than the lower figure and approach the Heubner standard more closely. Talbot adds, finally, it is probable that infants fed on cow's milk, particularly on formulas containing large amounts of protein, will require even more food than infants fed on human milk, because the stimulating action of protein causes extra heat to be burned during digestion. The caloric requirements of normal infants obviously are not the same as those of the sick infant whose "basal" metabolism is higher per kilogram of body weight and who may use up additional energy because of increased restlessness from colic or discomfort, burn it up in fever, or may not absorb all the food given him, as happened in one infant who lost 20 per cent. of the food calories in the feces. Neither does it apply to the infant with a subnormal temperature, indicating depressed vital functions. These infants come under another category and require further study to answer many of the points now obscure.

1. Benedict, F. G., and Talbot, F. B.: The Physiology of the Newborn Infant, Carnegie Institution of Washington, 1915, Bull. 233. Murlin, J. R., and Hoobler, B. R.: The Energy Metabolism of Ten Hospital Children Between the Ages of Two Months and One Year, Am. Jour. Dis. Child., February, 1915, p. 81.
2. Rose, Mary Swartz: Feeding the Family, New York, 1916.
3. Talbot, F. B.: Twenty-Four-Hour Metabolism of Two Normal Infants with Special Reference to the Total Energy Requirements of Infants, Am. Jour. Dis. Child., July, 1917, p. 25.
4. Lusk, Graham: The Elements of the Science of Nutrition, Philadelphia, 1917.

Current Comment

THE COST OF MARKET MILK

THE JOURNAL has repeatedly directed attention in the past few months to the importance of maintaining unimpaired the milk supply and, if possible, increasing the production of milk in the United States in the present emergency. The reasons need not be reiterated here. The desirability of providing "a quart of milk a day" for every child is only one of the impelling circumstances for securing as much as possible of this food. In the past there have been few articles of diet which furnished so much quantitatively and qualitatively in the way of desirable nutrients in palatable form as a quart of milk at the prices current before the recent skyward tendency of costs. As there is great danger that consumption of milk will be much decreased, and since much unfavorable comment is already making itself felt, it is imperative that those vitally concerned, as is the physician in eminent degree, should understand the situation in its true light. If 10 to 15 cents per quart represented exceptionally high prices of milk before the war, it does not follow that they are in any sense exorbitant at the present time. Adequate calories can no longer be purchased at the rate of 20 cents per adult requirement per day. War means sacrifice that expresses itself in increased payment for service and materials in every direction. Economy is only one form of material sacrifice in war time. As part of its program the Connecticut Committee on Food Supply has just published studies from a survey on the cost of market milk production.[1] This deals with statistical facts rather than with exaggerated generalities bearing on the actual cost of producing milk under present conditions, that is, with the abnormal increase in prices for feed, labor and other items. After all, the dairy cow is no mysterious agency, but merely a machine, as it were, for converting one kind of food into another. The output and intake are correlated in cost, and the machine must be carefully managed. In typical communities in the Eastern United States, where the milk must be produced near to an immediate market, the cost of milk production on 178 representative dairy farms for the year ending April 30, 1917, was 5.53 cents per quart, or $2.57 per hundred pounds. In April, 1917, however, the cost was 6.29 cents per quart, or $2.92 per hundred pounds, with labor at the yearly rates. There is no profit in producing milk at the lower price. The cost per quart has advanced more rapidly than the increase in price received in the past few years. As the result of a census taken among 2,500 farmers there was shown a decrease in mature dairy stock for the year of 4.5 per cent. and an increase in young stock of 6.7 per cent. There was a net decrease of all dairy stock of 1.6 per cent. This represents the conditions on farms remaining in the dairy business, where, through summer conditions and patriotic motives, they have been able to nearly maintain their herd numbers. This fall, with winter conditions ahead, if conditions appear to be the same as last year, many men will probably reduce their herds. This is one of the conditions that must be averted if possible. A frank understanding of the situation will help in the impending emergency.

1. Musser, K. B.; White, G. C.; McDonald, B. A., and Judkins, H. F.: Studies from the Survey on the Cost of Market Milk Production, Conn. Agr. College, Extension Service, Bull. 7, July, 1917.

THE BLOOD LIPOIDS IN ANEMIA

Amid all of the conflicting views and uncertain evidences regarding the etiology or pathogenesis of the severer types of anemia, and particularly pernicious anemia, practically only one characteristic feature remains undebated, namely, the ready destruction of the red blood cells. As hemolysis has been associated in recent years with the reactions of certain lipoids, the investigators of the anemias have given consideration to the possible pathologic variations of these compounds in the blood during the course of the disease. Utterance has been given to the view that an undue amount of specially hemolytic products, such as the unsaturated fatty acids, may appear and thereby account for the disintegration. Supporters of this conception call attention to the experimental production of crises resembling those of pernicious anemia, as the result of excessive feeding of cottonseed or olive oil. Again, the lack of normally present antihemolytic blood constituents, such as cholesterol, has been postulated as the real pathogenic factor involved. There are many scattered data in medical literature bearing on the features just mentioned. Until quite recently, however, the methods for accurate study of the lipoids of the blood have been decidedly uncertain, so that comparative estimates could not easily be formed. At the Harvard Medical School, Bloor and MacPherson[1] have undertaken a timely revision of the subject in order to determine with up-to-date precision to what extent, if any, the blood lipoids may be abnormal in anemia. The outcome may be summarized by the statement that the results offer no certain evidence that abnormalities in the lipoids are responsible for the disease. Nevertheless, the low values sometimes found for cholesterol, which is an antihemolytic substance, and the reported high fat fractions, which may indicate the presence of abnormal amounts of hemolytic lipoids in the blood, are possible causative factors of which, to quote the Boston investigators, further study is desirable at this time. In view of the association of the spleen with the destruction of the red blood corpuscles, and the assumption that hyperactivity of the spleen is sometimes a cause of anemia, splenectomy has been advocated and undertaken for the relief of the condition. Without venturing any conclusion at this time regarding the efficacy of removal of the spleen in the severe anemias, we may note that the operation is followed by blood-lipoid changes. There is an increase in total fatty acids and lecithin in the corpuscles and of cholesterol in the plasma. But the results are essentially the same whether the patients have had anemia or not. In most cases of anemia the lipoid composition of the corpuscles has been found to be normal; that is, analysis has disclosed nothing in their make-up chemically to indicate any abnormal susceptibility to hemolysis.

1. Bloor, W. R., and MacPherson, D. J.: The Blood Lipoids in Anemia, Jour. Biol. Chem., 1917, **31**, 79.

IS THERE A FATIGUE TOXIN?

In the domain of medicine explanations of phenomena are not infrequently colored by the popular theories of the day. It has always been difficult to elucidate the chief manifestations of fatigue. These have been further complicated by the peculiar interrelations of the nervous and muscular system where the problem of fatigue is concerned. Not long after the toxin antitoxin theories began to attain a vogue in immunology, the claim was made by Weichardt, in 1904, that the chief agent in the production of fatigue is a specific substance, a fatigue toxin. A corresponding or identical substance, designated "kenotoxin," was alleged to be produced by chemical manipulation of protein materials in definite ways. However obtained, these substances were asserted to have the significant property of inducing the development of an antitoxin when they were introduced in suitable ways into the animal organism. Here then there was presented an apparent opportunity of combating fatigue by scientific methods quite as striking as the subsequent method of eliminating certain cases of laziness and languor by eradicating the hookworm from mankind. Like so many other hopes of promise this too seems to have been shattered by the outcome of critical investigation. Only recently Lee and Aronovitch[1] of the Department of Physiology at Columbia University, New York City, have subjected the specific fatigue toxin to a crucial test. They noted that when test muscles were suspended in the juice of fatigued muscles of animals their working power was diminished considerably in comparison with the contractile power of normal muscles not treated with juice. But practically the same quantitative effect was observed when the test muscles were subjected to the juice of nonfatigued muscles. The New York investigators conclude that no acutely toxic fatigue substance is produced. Weichardt's assumption of the existence of a specific fatigue toxin is therefore not sustained. It seems probable, they say, that Weichardt's animals, which were actually killed by his extreme methods of inducing fatigue, were put into a profoundly pathologic condition in which the toxic component of the protein molecule was split off. There is no reason to believe that this occurs in the normal course of fatigue.

1. Lee, F. S., and Aronovitch, B.: Does a Fatigue Toxin Exist? Proc. Soc. Exper. Biol. and Med., May 16, 1917, **14**, 153.

Rodent Destruction on Ships.—Investigation of the efficiency of fumigants for the destruction of rodents on ships was made by Creel and Simpson of the Public Health Service (*Public Health Reports*, Sept. 7, 1917). Intensive trapping after fumigation was employed to determine the effectiveness of the agents used, among them being sulphur dioxid and cyanogen gas. From this investigation it is said that a fair estimate shows that cyanid gas is superior to sulphur dioxid, besides requiring shorter exposure and consequent keeping of fumigated vessels out of service. Fumigation of 182 vessels resulted in the destruction of ninety-five out of each 100 possible rodent inhabitants, while sulphur dioxid destroyed only seventy-seven of a possible 100 in a series of sixty-two vessels. The time of exposure to the sulphur was six hours, and to the cyanid gas one and one-fourth hours. It is not believed possible to obtain 100 per cent. destruction by either agent.

Medical Mobilization and the War

IN FLANDERS' FIELDS

NOTE.—The verses printed below appeared recently in the New York Sunday *Times*, as "By Capt. John McRae." The author, who is still in France, is Dr. John McCrae, Guelph, Canada, a brother of Dr. Thomas McCrae of Jefferson, Philadelphia. Dr. William H. Welch, in calling our attention to this poem and suggesting its reproduction in THE JOURNAL, said: "I met him a year ago in a Canadian hospital where he had charge of the medical service. He gave me the most gripping account of the hell in which fighting goes on at the front, where he had been, that I have ever heard. The verses are so simple and direct they seem to me among the best produced by the war."—THE EDITOR.

In Flanders' Fields

In Flanders' fields the poppies blow
Between the crosses, row on row,
That mark our place, and in the sky
The larks still bravely singing fly,
Scarce heard amidst the guns below.
We are the dead. Short days ago
We lived, felt dawn, saw sunset glow,
Loved and were loved, and now we lie
In Flanders' fields.

Take up our quarrel with the foe,
To you from falling hands we throw
The torch—be yours to hold it high.
If ye break faith with us who die,
We shall not sleep though poppies grow
In Flanders' fields.

NEW ASSISTANT SURGEONS, U. S. NAVY

On September 25, Gen. W. C. Braisted, U. S. Navy, welcomed into service a class of sixty-one Navy assistant surgeons graduating from the Navy Medical School at Washington, D. C. The majority of the class are members of the Naval Reserve Medical Corps who had been ordered to the medical school for two months of intensive training.

A number of the graduates were unable to attend the graduating exercises as they were either already on active duty or were taking postgraduate work elsewhere. Some have gone to New York City for a course at the Rockefeller Institute; some to take up the study of problems appertaining to aviation; some to the laboratory of the Washington Medical School for training in technic for the detection of germs and germ carriers of infectious diseases; and others are on duties of confidential nature.

The members of the class on active duty are: Ely L. Whitehead, Evanston, Ill.; Matthew L. Carr, New York City; Dozier H. Gibbs, Alabama City, Ala.; Normal King, Waco, Texas; Robert L. Schaefer, Allentown, Pa.; Claud W. Colonna, Mappsville, Va.; Robert T. Canon, Lufkin, Texas; William J. Corcoran, Portland, Ore.; Robert N. Hedges; Ernest Larkin, Carthage, N. C.; Everett Taylor, Lancaster, S. C., and William T. Gill, Washington, D. C.

The eight at the Rockefeller Institute include: William C. Blake, Baltimore; Tracy T. Gately, New Orleans; Frank W. Ryan, Maryville, Mo.; Nelson W. Sheley, Independence, Mo.; Lyman E. Dockry, Green Bay, Wis.; William E. Morse, Annapolis, Md.; Charles H. Savage, New Orleans, and John W. Vann, Danville, Va.

The twelve with the Aviation Corps are: Victor Armstrong, Minneapolis; Clarence J. Brown, St. Louis; Henry Le R. Franklin, Benchley, Texas; Harry C. Gebhardt; Lloyd B. Greene, Augusta, Ga.; Eugene D. Hardin, Toomsuba, Miss.; Bruce F. Holding, Wake Forest, N. C.; Robert H. McMeans, Palestine, Texas; Clarence N. Meador, Chicago; Guy B. Taylor, Gibert, S. C.; William R. Taylor, New Washington, Ind., and Frank B. Wallace, Holden, Mo.

The eight in laboratory work include: John W. S. Brady, Boston; George A. Gray, Detroit; Robert P. Henderson,

Tampa, Fla.; David R. Higbee, New York City; Thomas J. Kennedy, South Hadley Falls, Mass.; John M. McCants, Guthriesville, S. C.; Charles K. Reinke, Philadelphia, and Eben E. Smith, New York City.

Twenty-one are on special duty, including: John C. Adams, Superior, Wis.; William H. Frampton, Charleston, S. C.; Everett K. Geer, St. Paul; Bertram Groesbeck; Benjamin H. Hager, Edmonton, Alta.; Frank W. Hartman, Elliot, Iowa; James E. Houghton, Washington, D. C.; Louis Iverson, Badger, Minn.; Travis S. Moring, Abbeville, Ala.; Fred A. Nause, Sheboygan, Wis.; Matheson J. Montgomery, Pitcairn, Pa.; Carl A. Broaddus, Newton, Va.; John J. Sale, Fredericksburg, Va.; James A. Fields, Norfolk, Va.; Burton E. Belcher, St. Petersburgh, Fla.; Guy B. McArthur, Bloomville, N. Y.; Charles D. Terrel, Washington, D. C.; Sterling Cook; Harry Brockan; George B. Dowling, Washington, D. C., and Frank A. Williams, Quincy, Ind.

"WELL RECOGNIZED MEDICAL SCHOOLS"

MEDICAL SCHOOLS WHOSE STUDENTS WILL BE RECOGNIZED FOR EXEMPTION

In announcing the supplemental regulations authorized by the President regarding the exemption of students and hospital interns from the draft, the term "well-recognized medical school" was used (THE JOURNAL, September 8, p. 830). Among the preliminary regulations prescribed by the Surgeon-General's Office for carrying out the supplemental regulations was this definition:

"For the present a medical school recognized generally by state examining boards will be considered as a well-recognized medical school."

In view of the indefiniteness of this definition, the Surgeon-General has now announced the following:

"A well-recognized medical school is one legally authorized to confer the degree of Doctor of Medicine, and is recognized by at least fifty per cent. (50%) of the States of the Union, through their licensing boards for the practice of medicine."

"An institution which gives the first two years of the medical course will be recognized if its students after completion of these two years are eligible to admission to the third year of a 'well-recognized' medical school." Recognition by 50 per cent. of the state medical licensing boards means recognition by at least twenty-four states (not counting Alaska or the District of Columbia).

On this basis the following medical colleges, arranged alphabetically by states, would be included under the definition as "well-recognized medical schools": Univ. of Ala.; Univ. of Ark.; Leland Stanford Jr. Univ.; Univ. of Calif.; Hahnemann Med. Coll. of Pacific; Coll. of Phys. & Surg., Los Angeles; Oakland Coll. of Med. & Surg.; Univ. of Colo.; Yale Univ.; George Washington Univ.; Georgetown Univ.; Howard Univ.; Emory Univ. (formerly Atlanta Med. Coll.); Univ. of Ga.; Loyola Univ. (formerly Bennett Med. Coll.); Chicago Coll. of Med. & Surg.; Hahnemann Med. Coll., Chicago; Northwestern Univ.; Rush Med. Coll.; Univ. of Ill.; Indiana Univ.; State Univ. of Iowa Coll. of Med.; State Univ. of Iowa Coll. of Homeo. Med.; Univ. of Kan.; Univ. of Louisville; Tulane Univ.; Bowdoin Med. School; Johns Hopkins Univ.; Univ. of Md.; Boston Univ.; Harvard Univ.; Tufts Coll. Med. School; Detroit Coll. of Med. & Surg.; Univ. of Mich. Med. School; Univ. of Mich. Homeo. Med. School; Univ. of Minn.; Univ. of Miss.*; Univ. of Mo.*; St. Louis Univ.; Washington Univ.; John A. Creighton Med. Coll.; Univ. of Neb.; Dartmouth Med. School*; Albany Med. Coll.; Columbia Univ.; Cornell Univ.; Fordham Univ.; Long Island Coll. Hosp.; New York Homeo. Med. Coll.; Univ. and Bellevue Hosp. Med. Coll.; Syracuse Univ.; Univ. of Buffalo; Leonard Med. School*; Univ. of N. C.*; Wake Forest Coll.*; Univ. of N. D.*; Western Reserve Univ.; Eclectic Med. Coll.; Univ. of Cincinnati; Ohio State Univ. Coll. of Med.; Ohio State Univ. Coll. of Homeo. Med.; Univ. of Okla.; Univ. of Ore.; Hahnemann Med. Coll., Philadelphia; Jefferson Med. Coll.; Medico-Chirurgical Med. Coll.; Temple Univ.; Univ. of Pa.; Woman's Med. Coll. of Pa.; Univ. of Pittsburgh; Med. Coll. of State of S. C.; Univ. of S. D.*; Meharry Med. Coll.; Vanderbilt Univ.; Univ. of Tenn.; Univ. of Tex.; Baylor Univ.; Fort Worth School of Med.; Univ. of Utah*; Univ. of Vt.; Med. Coll. of Va.; Univ. of Va.; W. Va. Univ.*; Marquette Univ.; Univ. of Wis.*

* These colleges give only the first two years of the medical course.

THREE MONTHS OF IT

The following letter was addressed to the chairman of the program committee of a county medical society who forwards it to THE JOURNAL:

"Your recent letter asking me to give an account of a medical man during three months in the Army 'in 500 or 1,000 words' reminds me of the publisher's order to his 'hack' to write 'a snappy history of the world in a hundred pages.' I am contemplating a four volume work along the lines you suggest but will essay to give the high lights of the adventure within the compass alloted.

"Dr. ——— and I left our firesides and electric fans on June 6, bound we knew not whither, but were enlightened by another reserve officer on the train, whose cousin was in Congress. His information which was thus authentic, he imparted to us. We were going to Russia! I was glad of this for I had never been there and it seemed a good place to spend the summer. Dr. ——— who met us at the train in San Antonio also knew where we were going. We were going directly to France. Of this I was not quite so glad. On arriving at the hotel we encountered one other officer—a resident of Washington thus close to all knowledge—who laid down as a positive rule that no medical reserve officers would go abroad, only regular Army officers. Thus all doubts of our destination being laid at rest, we slept soundly, and reporting to the department surgeon the next morning were sent over to the base hospital for examination.

"This rite was conducted by a young lieutenant in the Medical Corps—a youth of haughty mien and deep preoccupation. We had apparently interrupted him at some important task. I have since learned he was perfecting a new golf stroke, for he was somewhat brusque with us. He ordered us to strip and when we had done so he gave a glance at me as Apollo Belvedere and yelled 'Figure stout' to an orderly who was copying our dimensions and limitations at the far end of the room. Thus were our spirits begun to be broken.

"While awaiting our assignments we were quartered in a hospital ward and here I made the acquaintance of Arthur. He was our orderly and he was more. Arthur was affable, he was about as affable as a major-general. Lieutenants, I have found, both first and second of the regular Army, are difficult to engage in conversation—human intercouse with them seems to be largely a matter of grunts—and difficult also to extract information from. (I have found since that there is good reason for this.) Furthermore they are always very busy. Captains, while not quite so busy and more familiar with the forms of English speech, are equally chary of the disclosure of facts—I don't mean facts about the war—I mean where the postoffice is and isn't it a hot day. Majors have less to do, which prevents them from the arts of conversation, while colonels and brigadier-generals and such, they like to talk, will cross the street to say how-de-do and see if there is anything they can do for you. Well, now, Arthur was like that. He told me about his sister's divorce, and where the best place was to get my uniform made, and what he thought about the war, all the first night he met me. The next day he told me how to salute soldiers on the streets, gave me a rough general notion of the enlisted man's idea of an officer, offered voluntarily to try one of my cigars, and confidentially informed me that if my craving got great enough he could obtain whisky or other libation of an alcoholic nature.

"Dr. ——— was ordered to El Paso soon after this and I alone sat lingering here. Alone, that is except for the 10,000 aviators at Camp Kelly, the Ninteenth and Fifty-Seventh Infantry, the Third, Seventh, Nineteenth, Twentieth and Twenty-First Field Artillery, the Third Cavalry, and various little things like Signal Corps, the Hospital Corps, the Officiers Training Camp, and a drill sergeant. But many things began to happen. I began to know the gulf which separates 'not in line of duty' from 'in line of duty.' Also that when a soldier has a convulsion he is not necessarily very sick, he may only crave a day off in a nice cool hospital; that a temperature of 106 may only mean he has been smoking a cigarette against the bulb of a thermometer. And high in my chamber far away from this vulgar gaze of the populace and the gentle voice of drill sergeants, I practiced 'about face' as it is done in the U. S. Army, as it used to be done in the U. S. Army, as it is done in the English army, the Swedish army, and the Swiss army—we had a very learned drill sergeant.

"And now—well now—I'm just about like all the rest. I grunt at new reserve officers like a regular lieutenant. My uniform has been to the laundry several times, has passed from brown to light brown, to dark green, to light green, to

light yellow and is now about the color of a cirrhotic liver in the last stages. So that I give the appearance of the oldest inhabitants. I can now 'about face' in every language except some of the obscure dialects of Chinese, with only a momentary period of embarrassment. I acknowledge salutes without trying to take off my hat or blushing.

"Incidentally the summer has been one of the most interesting of my life, both professionally and patriotically. We have had many cases of rheumatism, pneumonia, spinal meningitis, a few of paratyphoid fever, several gastric ulcers, one syphilis of the lung, and one of Pick's disease. And Russian generals and French aviators, and English artillery officers, reviews, aviation meets, etc., have been too numerous to catalogue. We have seen a city built for the new National Army division in thirty days, and are just beginning to have the new National Army arrive.

"Since beginning this letter, we have been shocked at the news of the death of Fitzsimmons of Kansas City. After hearing about it four medical officers who are shortly going to France have told me that the first ten German officers they get in their wards are going to die mysterious deaths!!! When I said that wasn't giving them much chance one of them asked me how much of a chance poor Fitz had. And there was nothing to answer. So you see, the dirty blackguards of baby maimers' and hospital bombers' idea worked out fine. They've got everbody scared of them—yes, they have."

A TWO DAYS' BIVOUAC MARCH AT FORT BENJAMIN HARRISON, INDIANA

Two companies of medical officers, numbering about one hundred each, of the First Battalion of the M. O. T. C., Fort Benjamin Harrison, Indiana, commanded by Lieut.-Col. G. H. Scott, M. C., left the fort at 7 a. m., Sept. 14, 1917, for a practice march of two days' bivouacking at "Camp Scott" for the night.

The duties to be performed in this march included: (*a*) tactical problems for sanitary troops; in other words, the selection and location of stations for ambulance trains, field hospitals, and dressing stations, with a war map for a guide; (*b*) lectures by Lieutenant-Colonel Scott on tactics of sanitary troops; (*c*) map making and map reading.

In addition, Company No. 1, Capt. H. L. Celler, M. R. C., instructor, had rations issued raw, except coffee, which was prepared for the whole company. For this purpose the company was divided into groups of eight men, each group being directed to build its own fires and prepare its own meals.

To the uninitiated the program may seem simple; nevertheless, elucidation is needed for its comprehension.

The tactical problem may be explained as follows: Fort Benjamin Harrison was being attacked by the Red Army and defended by the Blue. Information had been brought into the fort from various sources that the enemy was approaching. A division of the Blue Army had entrenched in a line of hills between the fort and the Reds, to check their advance. The sanitary troops of the Blue Army were sent out to locate sites for field hospitals, ambulance and dressing stations, using Fort Benjamin Harrison as an evacuation hospital, and were given military maps as a guide. To make the problem more realistic, a district of the country was selected which was entirely unfamiliar to the student officers.

This duty is far more complicated than it sounds. In the first place, a military map to many of us was as much of a conundrum as was the discovering of the points of the compass after wandering around in the country for several hours. We were as much lost on the chart as we were on the ground, and the commanding officer must have been sorely tried by the necessarily frequent repetition of putting many of us back on the map.

After marching and countermarching for an entire afternoon, up hill and down again, through ravines, over fences, through the mud and dust, the necessary stations for the care of the wounded were finally established—on this particular occasion, I fear, long after the Red Army had been driven back over "Schlitz River."

Tired and footsore, we marched back to bivouac to receive our supper rations. These consisted, per head, of two raw eggs, a sweet and an Irish potato (raw), salt and pepper, and two slices of salt pork. We had with us our kits, each consisting of canteen and cup, a meat can, which is a small covered skillet with a handle, and a knife, fork and spoon. We were instructed to go about preparing this feast, and were introduced to a pile of wood to be used for fires, and specially selected spots where fires would be allowed. The sacred army coffee we were not allowed to prepare. This was to be made by the regular cooks of the mess.

All this to one hundred medical men not long since accustomed to the College Inn's sirloin steaks or Delmonico's best, with their cooks, waiters and glad smiles provided! Disappointment is in store for you if you believe that these doctors reneged on the job. They went about the task like old-timers. In less than no time the miniature field ovens were burning briskly, with the little skillets of pork and scrambled eggs sizzling in veteran style. Perhaps it was the appetites which acted as the stimulus to produce the results. They were due more likely to the hunting and camping experiences of past vacations, the advice of instructors, and of those in the company who hailed from the West. Some of the groups were baking their potatoes in a bed of embers, and others French-frying them in the skillets. When we consider that only a few weeks ago these same doctors had never thought of such life, the sight of their industry and the success of their efforts were truly surprising.

Perhaps being in the Army is responsible for this transformation. More probably, however, such development was only made possible by the same motive which prompted these men to give up their life work and to leave their homes from a sense of duty. Many of the tasks are hard and fatiguing, and sometimes extremely unpleasant. It is the willingness to accept the restraints of discipline without complaint or shirking which is making soldiers of these men.

The scene of these little groups bending over their fires was an inspiration. In them were some of our ablest internists, surgeons and specialists, some others just entering on their medical careers, and others again with long established reputations; youngsters of 25 and youngsters of 50—all bent on the same task of acquiring knowledge of their new work in the shortest time and the most thorough manner possible. The spirit behind it all, and the untiring and efficient instruction of the Regular Army Medical Officers are the real causes which are accomplishing results; and if the rest of the country in arms is as earnest, as willing, and as thorough as the doctors in the various camps, there need be no fear for the quality of the army now under preparation.

After the meal had been prepared and had disappeared into our hungry stomachs, we washed our dishes and went about selecting a soft spot on which to lay our bedding rolls. A bedding roll is a large, oblong piece of dark-colored canvas, to the outside of which three large straps are attached. The roll, as a usual thing, contains a thin mattress, three blankets and a pillow. When unrolled, the canvas folds over the blankets and buckles, and into this the sleeper crawls feet first, hoping that the piece of ground of his selection contains depressions corresponding to his own protuberances. Even though all this may sound forbidding, it is, however, snug, warm and comfortable after some experience. On this occasion a heaping fire was built, around which we sat and sang while digesting our culinary efforts, and then crawled into our rolls at the late hour of 8 p. m., to sleep the sleep of exhaustion.

Bright and early the next morning, at 5 a. m., we were routed out and given a short time to brush our teeth and wash the sleep out of our eyes at a nearby spring, and then were put through a sharp, exhilarating drill of setting-up exercises before being called to our breakfast, happily prepared by our company "mess."

The second day was a repitition of the first, with a sharp quiz on the work gone over, and a most instructive and interesting lecture by Lieutenant-Colonel Scott.

At the end of the day the bedding rolls were piled into army trucks and the entire camp was policed. Here, again, the "medics" covered themselves with glory by the thorough manner in which they carried out their work. Policing a camp is nothing more or less than scavenger work. Everything with which the camp ground had been littered—papers, potato peelings, and what not—was picked up by hand and burned. All holes made for the fires were filled in and the ground left clean. With hardly a trace of their presence left behind, the two companies assembled for the long march home.

Not alone was this campaign in miniature a complete success from the educational standpoint, but it also constituted a remarkable exhibition of the beneficial effects of the physical training of camp life on those who only a few short weeks before were firmly rooted in the sedentary habits of civil life.

CHARLES H. PARKES, M.D.
Captain, M. R. C., U. S. Army. Company 1, M. O. T. C., Fort Benjamin Harrison, Ind.

NEWS OF THE CANTONMENTS

(From Our Special Correspondents)

Camp Grant, Ill.

At the opening of Camp Grant, September 5, there were more than enough physicians present to take care of the first quota of the new National Army, and shortly enough new doctors arrived to complete the medical personnel for the division. These men were under Lieut.-Col. J. M. Phalen, M. C., the division surgeon. The medical staff were distributed among the various organizations, in the line, the base hospital, a field hospital and an ambulance company.

The base hospital under Major Michie, M. C., was already in running order, in temporary quarters, which were equipped for the care of all hospital cases. Noted specialists were assigned to its staff so that all classes of disease could be skilfully treated. Several experts were assigned to the camp to make careful examination of selected cases in their specialty. The base hospital had a laboratory which made the ordinary clinical examinations and made daily examination of the water supply.

The sanitation of the camp was under Major Bailey, M. C., who ably handled the many difficult problems which presented themselves.

The camp has been unusually free from sickness, and the hospital has had a small number of cases. Most of the cases now in the wards are in men who were sick before they left their homes.

A DAY WITH THE MEDICAL OFFICER

The life of the medical officer is a pleasant although a somewhat strenuous one. Calisthenics begin at 6:10, when every one gets thoroughly warmed up by an athletic junior officer who, for the time being, has no respect for rank or figure. Well-nourished specialists with international reputations are becoming as trim as racing yachts, and, although they pant and blow in the process, they do not utter a word of complaint. Mess is from 6:30 to 7. At 7:30 all turn out for drill in marching and until 8:30 every one learns the various sanitary formation. Again the drill master is no respecter of person and woe betide the man who "forget where his right hand lieth." From 9 to noon is devoted to medical work about the hospital. Mess is at noon. At 1:30 there is instruction in delicacies of the transfer card and other Army paper work. Some of the regimental surgeons wonder, when their transfer cards come back with "diagnosis not concurred in," whether they have forgotten their art, but they usually find they have neglected to state whether the condition was acute or chronic, catarrhal or suppurative. At 2:30 most of the ward surgeons devote an hour to instructing the ward nurses. The rest of the day is devoted to finishing up odds and ends. It will be seen that a conscientious man will be busy from early morn to late at night. There is a large amount of good material at hand, and, if a man digs into it, he can get a wonderful amount of good out of it. The work is not all medical by any means and is of such varied nature that there is little chance to grow "stale." Efficient effort is well worth while, for the man who "can and does" gets the best place and is soon repaid for his efforts.

Camp Zachary Taylor

The medical situation at Camp Taylor, Dumesnil, Ky., which has been under way for about one month under the supervision of Lieut.-Col. John H. Allen, is rapidly assuming permanent form. In the camp there are at present seventeen regimental infirmaries in the care of the regimental surgeons and the base hospital. The work since the onset has been that of examining conscripts, caring for the acutely ill and isolating the unfit infectious cases before discharge from the army.

The new men after being assigned to their companies are given their physical examinations and triple typhoid and smallpox vaccine by a board of regimental surgeons. Any with outspoken defects and the doubtful ones are referred to the "Reviewing Board," an organization composed of the heads of the various departments including the specialties. Final disposition of the case remains in their hands.

The examination of the first 5 per cent. of the conscripts pointed out many defects in system both in the regimental boards as well as in the Review Board, which when corrected made the examination of the second 40 per cent. move much more quickly and efficiently.

Many interesting medical conditions have been found which it is hoped we will have the opportunity to dilate upon at another time, several of these cases being in the base hospital at present.

BASE HOSPITAL

The base hospital has been in permanent quarters for two and one-half weeks and is occupying eight of the thirty-two wards. There are at present 216 patients in the hospital, divided as follows: medical, 23; surgical, 24; genito-urinary, 103; ophthalmologic, 53; neuropsychiatric, 13. The large number of genito-urinary patients is composed mostly of men with active syphilis, who are isolated before being discharged from the army.

The fifty-three ophthalmologic cases are trachoma, mainly from the mountain regions of Kentucky, and have been the source of much interest. Major John McMullen, U. S. Public Health Service, came last week to see these patients, and gave an interesting clinic on them. Major McMullen, formerly at Ellis Island, is at present in charge of the trachoma work in Eastern Kentucky, Virginia, West Virginia and Tennessee and is well qualified to speak on this subject. As a result of this large number of cases of trachoma, a general survey of the camp in the hands of experts is being contemplated.

SOCIAL

Major Nelson M. Black, M. R. C., from the Surgeon General's Office, spent part of the week visiting the camp. He addressed the staff of the base hospital on "Surgery of the Head," the specialty to which he is detailed.

Major John Ridlon, M. R. C., supervising orthopedic surgeon, was a new arrival this week. He will spend a few days, giving a course of lectures on his specialty and then continue on his circuit. Major Ridlon, who is honorary professor of orthopedic surgery at Northwestern University, is the fourth Chicago major at the base hospital. The other three are: Major William H. Wilder, M. R. C., professor of ophthalmology at Rush Medical College; Major F. Menge, M. R. C., professor of otolaryngology at Northwestern University, and Major Walter W. Hamburger, M. R. C., associate professor of medicine at Rush Medical College.

Camp Lee, Petersburg, Va.

Every one who comes to Camp Lee, Va., soon realizes that this is historical ground, for a little walk along the western part of the camp reveals rifle pits and in the woods along the edge of the camp are trenches and redoubts which were made by the federal forces during the famous siege of Petersburg in 1864. The base hospital is located in this area and in digging the foundation many interesting Civil War relics were found. Although many boys earned their pocket money by picking up lead from the battlefields, a little search brings to light a "minie" ball or shell fragment. About 2 miles to the west of the camp is a ridge where the Confederate works were built and there is still present the deep "crater" formed by the explosion of a mine on July 30, 1864. The mine was dug and planted by a regiment of Pennsylvanians and was the first mine exploded in war.

The camp was named after Gen. Robert E. Lee, who was in command of the Confederate forces during the defense of Petersburg. Today Pennsylvanians and Virginians, with West Virginians as well, instead of being antagonists, are drilling as brothers on this battleground.

Some of the barracks are built on the Prince George Court House Road traveled over by LaFayette and Virginia soldiers during the Revolutionary War and Yorktown is but 30 miles away.

PERSONNEL

Work was begun at the camp in June. The forest was cleared and buildings commenced. Major Henry P. Carter, M. C., U. S. Army, was appointed sanitary inspector and began his work the middle of July. Major Carter was well fitted for the work as he had just returned from three years' service in the Panama zone, where he had served as health officer of Ancon and Panama. In the latter part of July Capt. Hugh T. Nelson, M. R. C., Charlottesville, Va.; First Lieut. William F. Merchant, M. R. C., health officer of Manassas, Va., and First Lieut. Harry R. Seelinger, M. R. C., Norfolk, Va., were assigned to assist Major Carter. Under Major Carter's directions all swamp and marshy areas have been ditched and oiled, so that now instead of many anopheles mosquitoes there are none and only an occasional larva is found whose ambitions are promptly drowned by a dose of crude oil.

Major Ferdinand Schmitter, M. C., U. S. Army, came early in August to be commanding officer of the base hospital and acted as chief surgeon until the permanent assignment of the division surgeon. Major Schmitter has had a wide experience in administration and examination of recruits

and has been of great assistance in directing the examination of recruits.

Lieut.-Col. T. L. Rhoads, M. C., U. S. Army, was assigned as division surgeon early in September. Colonel Rhoads brought with him a wide experience in administrative work and is admirably equipped for the post. He had been specially selected by President Taft to represent the government in handling the relief work after the flood at Dayton, Ohio. Colonel Rhoads is well known in the Army and has served as operating, administrator and also in a sanitary capacity in Texas in 1916.

A number of medical officers were assigned to the division and base hospital before the arrival of the first quota. They were temporarily quartered in barracks pending the completion of the base hospital. While in the barracks they were constantly entertained by the negro stories told by Major Joseph W. Hope, M. R. C., Hampton, Va., and First Lieut. Isaac M. Goldman, M. R. C., Richmond, Va. Now that the hospital is nearly finished the officers and the patients under treatment have moved in. Medical supplies have been furnished by First Lieut. Romanus A. LaGrinder, S. C., who has had nineteen years' experience in Hospital Corps work, and is in charge of the medical supply depot.

Capt. Elliott B. Edie, M. R. C., came from Fort Oglethorpe the last of August with the personnel of a field hospital, and First Lieut. Burr Ferguson with the personnel of an ambulance company, whose organizations had been through a course of training under Colonel Page. The medical organization has been increased by the arrival of an ambulance company under the command of Capt. Charles L. Scott, M. R. C., Raleigh, N. C., organized by the Raleigh Red Cross. The Richmond Red Cross has also sent an ambulance company under the command of First Lieut. Charles H. Lewis, M. R. C.

EARLY EXAMINATIONS

The arrival of the second quota of the draft the last of September created great activity among the medical officers. Physical examinations, vaccinations, sick call and paper work kept them busy and troubled with many new duties. The work was well done and soon finished. Recruits for rejection and doubtful cases were referred to specialists at the base hospital. Special examinations for heart and lung cases were put under the direction of Major Lawrence Litchfield, M. R. C., Pittsburg, Va.; surgical conditions, First Lieut. William L. Peple, Richmond, Va.; genito-urinary, Capt. J. Bayard Clark, M. R. C., New York City; eye, ear, nose and throat, Capt. Llewellyn E. Hetrick, M. R. C., New York City, assisted by Capt. Lawrence Thomas, Latrobe, Pa. Medical work is now progressing smoothly and sanitary conditions are excellent. Petersburg furnished the camp with a safe water supply, drainage is excellent, the camp is well sewered, buildings are all screened against flies, and the health of the men is excellent. The sick rate is far lower than the sick rate of the Army in 1916.

The Patriotism of Sioux City

Dr. John W. Shuman of Sioux City, Iowa, writes: "I note in THE JOURNAL, Sept. 29, 1917, page 1090, under 'Medical Patriots of Rochester, N. Y.,' 13.1 per cent. of the physicians of that city have enlisted. I drop you this line to let you know that Sioux City has Rochester beaten on the percentage basis. Here is Sioux City's bit to date: the population is 65,000, there are 100 physicians practicing in the city, twenty-one of whom have been commissioned in the Army."

Exemption Asked for Dental Students

A committee consisting of Arthur D. Black, Chicago, chairman; H. E. Friesell, Pittsburgh; W. H. G. Logan, Chicago, and F. D. Casto, Cleveland, has submitted to the Provost-Marshal's Office arguments for the exemption of drafted dental students. The committee points out that there is no legal obstacle to the issuance of an order for dental students similar to that issued for medical students; that dental schools will lose a large number of students by the draft and, owing to the fact that all dental schools have extended their courses from three to four years this fall, there will be no graduating classes in 1920. It is stated that the supply of dental students is already less than the demand and that the present ratio of Army dentists is inadequate. This ratio calls for one dentist to each 1,000 men, which corresponds to a provision of one hour of dental service over six months for each enlisted man. It is argued that there should be at least one dentist for each 500 men in the Army. The committee points out that dentistry is closely related to the practice of medicine, that face and head wounds constitute 20 per cent. of the injuries in the war zone, and that the services of none of the various medical specialists are more important to the welfare of the Army than those of the dentist.

Food Division in Surgeon-General's Office

Major-Gen. William C. Gorgas, Surgeon-General, U. S. Army, has organized a division for safeguarding the food supply of the Army. This work is to be carried on in cooperation with the Quartermaster Corps and will include a food survey of each camp conducted by specialists in nutrition, together with inspection of food received for soldiers' rations and study of methods of preparation. It is desired not only to prevent sickness through improper food but also to recommend changes to provide more healthful and appetizing meals. About sixty commissioned officers will be engaged in the work of making food surveys at the camps, with about twice their number of enlisted men to assist in the work. Major John R. Murlin, formerly of Cornell University Medical College, will act as director.

Recommendations for Control of Venereal Disease in Michigan

The commission recently appointed to present recommendations for control of venereal disease as presented by the mobilization of the new army in Michigan has reported to Governor A. E. Sleeper, that at a meeting held in Lansing, September 28, the subject was carefully considered, with the view of presenting to the War Board a practical program designed to control and minimize this menace.

The commission stated that it does not harbor the illusion that venereal disease can be eradicated from the state by any program it might suggest. However, it is the unanimous opinion of its members that a great deal can be done to reduce the danger of venereal infection to the soldiers and to the civil population. It is obviously very necessary at the outset to secure the cooperation of the military authorities in any proposed plan of action.

The following general plan is recommended as the most practical means of securing the desired results:

1. The sources of infection to be located in every possible way.

By securing the cooperation of the military medical authorities in the reporting of cases from which soldiers have acquired infection.

The appointment by the state board of health of a special medical inspector to be stationed at Battle Creek, and the detailing of inspectors to other points if necessary.

Cooperation with the local health authorities of various communities in the state.

Suggestions to the cities of Battle Creek and Kalamazoo of the desirability of securing the services of full-time health officers.

Furnishing, by the state, of free laboratory tests for venereal diseases.

2. Segregation of infected persons.

Infected soldiers to be segregated in camp, by military authority.

Infected women to be segregated in detention hospitals or by house quarantine, if necessary.

Hospital facilities at Detroit and Ann Arbor being now available, the commission recommends the use of these hospitals until further arrangements can be made.

3. The treatment of infected persons.

Soldiers to be treated in camp by the military medical authorities.

Infected cases in the civil population to be cared for in the segregation hospitals above mentioned and in free clinics to be established at various points in the state.

4. The supervision of cured or arrested cases.

By paid social workers in each of the several communities near the encampment.

5. By enlargement of the protected zone.

The military authorities to be requested to extend the zones under authority of the act of May 18, 1917.

6. By a campaign of education.

In the military camps, through cooperation with the Medical Corps of the Army.

In communities throughout the state, under the auspices of the state board of health.

Cantonment and Camp Sites

Perhaps no words have been more used recently in questions of military operations in this country than the words "cantonment" and "camps." According to the Field Service Regulations:

When troops are sheltered under canvas, they are in camp. When resting on the ground without shelter, they are in bivouac. When occupying buildings in towns or villages, or huts specially erected, they are in cantonment.

Cantonments often develop through improvement of camps—huts or temporary buildings taking the place of tents.

Paragraph 236 of the Field Service Regulations of United States Army concerns shelter in the service of the interior. In itself it is a lesson in hygiene and sanitation. It says:

In mobilization and concentration camps, troops are sheltered under canvas or in temporary barracks, and proper provision is made for their health, comfort, and instruction. As a rule, such camps or cantonments should fulfil the following conditions:

1. The grounds should be easily drained, naturally healthful, large enough for depots, corrals, hospitals, etc., and the encampment of the troops without crowding, and with ample space for exercise and instruction.

2. The water supply should be excellent and abundant and not liable to contamination from any source.

3. There should be ample railroad and switching facilities and suitable arrangements for loading and unloading, as the fundamental reasons for the mobilization or concentration will be defeated if ample rail or water facilities are not available to promptly receive and dispatch troops and supplies.

4. All parts of the camp should be readily accessible by good wagon roads.

All arrangements for the accommodation and supply of the troops should be completed before their arrival by the permanent camp personnel sent ahead for the purpose. Camps are laid out so as to preserve the integrity of units, the headquarters of each being centrally or conveniently located with respect to its troops; tents are pitched and aligned, kitchens equipped, water and fuel supply arranged, latrines prepared, hospitals erected, and arrangements made for ample mail, telegraph, and telephone service. The general headquarters should be centrally located and connected by wire with the principal subordinate headquarters. Depots and storehouses are placed at railroad sidings and the hospitals near the railroad station. Trains are placed so as to interfere as little as possible with the comfort and cleanliness of the troops.

No individuals, troops, or trains of organizations temporarily present should be attached to the permanent camp personnel, if it can be avoided. It is the function of the permanent camp personnel to operate depots, hospitals, to maintain camp telephone and telegraph lines, etc. The troops temporarily present must be in constant readiness to move.

August 18, the Field Service Regulations were modified, and this paragraph was added:

5. Boards for the selection of permanent or semipermanent cantonment sites will include in their membership an officer of the Medical Corps.

All questions of sanitation and hygiene, relating to building construction, water supply, drainage, or sewage disposal for such cantonments, on which the board is not unanimously agreed, will be referred to the department commander for final action.

Orders to Officers of the Medical Corps

Lieut.-Col. J. C. Gregory, M. C., to Fort Benjamin Harrison, Ind., training camp, as instructor.

Par. 12, S. O. 210, Sept. 10, 1917, War D., relating to Major L. P. Williamson, M. C., is revoked.

Officers of M. C. to duty as follows: Col. T. J. Kirkpatrick to Fort Oglethorpe as surgeon; Lieut.-Col. F. C. Baker to Fort Oglethorpe, medical officers' training camp, as camp surgeon; Major J. W. Meehan from duty in Canal Zone to Syracuse, N. Y.

The following appointments in the Medical Corps are announced, to rank from the dates named, all in 1917: To be first lieutenants: First Lieuts. J. P. Kelly, Aug. 20; E. J. Farrow, Aug. 21; H. L. Freeland, Aug. 22; W. M. Archer, Jr., Aug. 23, and H. F. Philips, Aug. 24.

The leave granted Major F. N. Chilton, M. C., on account of sickness, is extended one month.

First Lieut. A. J. Canning, M. C., from Corregidor Island to Manila for duty.

Major P. L. Freeman, M. C., to duty at Fort Myer, Va.

Major E. G. Huber, M. C., to South Bend, Ind., for investigating the report of typhoid fever at that place.

Orders to Contract Surgeons

CALIFORNIA

To Camp Kearny, Linda Vista, Calif., from Arcadia, Calif., for duty as a member of a board of medical officers for the special examination of the troops for tuberculosis, Drs. Charles C. Browning, J. E. Fahy, Leon Shulman, Los Angeles; Lewis D. Remington, Monrovia.

CONNECTICUT

To Walter Reed General Hospital, Tacoma Park, D. C., and report to commanding officer for special instruction in tuberculosis examinations, Drs. George H. Jennings, Jewett City; Hugh F. Keating, New Haven.

DISTRICT OF COLUMBIA

To Walter Reed General Hospital, Tacoma Park, D. C., for duty, Dr. Francis S. Echols, Washington.

To his home from duty at Camp Lee, Petersburg, Va., Dr. Thomas A. Claytor, Washington.

ILLINOIS

To Walter Reed General Hospital, Tacoma Park, D. C., and report in person to commanding officer for special instruction in tuberculosis examinations, Dr. James S. Rankin, De Kalb.

LOUISIANA

To their homes from duty, Drs. Robert Bernhard, Harold J. Gondolf, James C. Cole, Edmund Moss, New Orleans; Robert A. Strong, Pass Christian.

MASSACHUSETTS

To his home from duty at Boston, Mass., Dr. Edward W. Taylor, Boston.

MISSOURI

To his home from Chickamauga Park, Ga., Dr. Scott P. Child, Kansas City.

NEW YORK

To Camp Sevier, Greenville, S. C., for the purpose of making examinations in his specialty and on completion of this work to return to his home, Dr. Robert J. Carlisle, New York City.

To Walter Reed General Hospital, Takoma Park, D. C., and report in person to commanding officer for special instruction in tuberculosis examinations, Drs. Leonard P. Sprague, Chateaugay; Percival F. Dalphin, Malone.

RHODE ISLAND

To Walter Reed General Hospital, Takoma Park, D. C., and report in person to commanding officer for special instruction in tuberculosis examinations, Dr. Jay Perkins, Providence.

TEXAS

To his home from duty at Leon Springs, Dr. Charles H. Carter, Smithville.

Orders to Officers of the Medical Reserve Corps

ALABAMA

To Army Medical School, Washington, D. C., for instruction, Lieut. Clarence C. Elebash, Selma.

To Camp Gordon, Atlanta, Ga., for duty as tuberculosis specialist and assistant to the Army Medical Staff, Capt. Cabot Lull, Jr., Birmingham.

To Camp Sheridan, Montgomery, Ala., for duty, Lieut. James R. Haigler, Montgomery.

To Phipps Clinic, Baltimore, Md., for a course of study in his specialty, Lieut. Robert H. Howard, Tuskegee.

To Post Graduate Hospital, New York, N. Y., for a course in orthopedics and on completion of this course to proceed to Boston, Mass., for further instruction, Capt. Paul L. Cocke, Birmingham.

ARIZONA

To Fort Benjamin Harrison for a course of instruction, Lieut. William A. Kinsley, Tuscon.

To Fort Benjamin Harrison for instruction, Lieut. Charles F. Thomas, Fordyce.

To Fort Des Moines, Ia., for instruction, Lieut. George W. Antoine, Prescott.

CALIFORNIA

To Camp Kearny, Linda Vista, Calif., from Arcadia, Calif., for duty as a member of a board of Medical Officers for special examination of the troops for tuberculosis, Capt. Ralph L. Byrne, Los Angeles.

To Camp Macarthur, Waco, Tex., from Psychopathic Hospital, Ann Arbor, Mich., to make examinations in his specialty, Lieut. William H. Holmes, Pomona.

To Fort Benjamin Harrison for instruction, Lieut. Clarence H. White, Los Angeles.

To Fort Des Moines, Ia., for instruction, Lieut. Claudius Ballard, Los Angeles.

CANAL ZONE

Par. 55, War Dept., Aug. 27, 1917, as related to Major Thomas D. Woodson, Corozal, modified so as to assign him to permanent duty in the office of the Surgeon General.

COLORADO

To Camp Dodge, Des Moines, Ia., for duty with Red Cross Ambulance Co., No. 30, Lieut. Jesse D. Wilson, Ideal.

CONNECTICUT

To Army Medical School, Washington, D. C., for instruction, Lieuts. Joseph A. Higgins, Manchester; Charles A. Jenkins, Willimantic.

To Camp Jackson, Columbia, S. C., from Walter Reed General Hospital, for duty as tuberculosis specialist and assistant to the Army Medical Staff, Lieut. Wilson Pendleton, Wallingford.

To Fort Benjamin Harrison, for a course of instruction, Capts. Thomas F. Scanlon, Georgetown; from Walter Reed General Hospital, for duty as instructor in tuberculosis examinations, Henry F. Stoll, Hartford.

DISTRICT OF COLUMBIA

To Camp Mills, Garden City, L. I., for inspection and on completion of this duty to return to his proper station, Major General William C. Gorgas, Washington.

FLORIDA

To Army Medical School, Washington, D. C., for instruction, Lieut. James E. Pennington, Wellborn.

GEORGIA

To Fort Benjamin Harrison for instruction, Lieut. Charles J. Woods, Darien.

To Fort Des Moines, Ia., for instruction, Lieut. Frank P. Raiford, Atlanta.

To home from Fort Oglethorpe on account of being physically disqualified, Lieuts. John W. Oden, and Thomas E. Oden, Blackshear.

ILLINOIS

To Army Medical School, Washington, D. C., for instruction, Lieuts. Marcus H. Hobart, Chicago; Guy V. Forney, Walnut.

To Camp Doniphan, Ft. Sill, Okla., from Psychopathic Hospital, Ann Arbor, Mich., to make examinations in his specialty, Lieut. Harry R. Hoffman, Chicago.

To Camp Grant, Rockford, Ill., for duty, Capt. French S. Cary, Chicago.

To Camp Greenleaf, Ft. Oglethorpe, for instruction, Capt. Thomas S. Crowe, Chicago; Lieut. Thomas W. Toler, Astoria.

To Fort Benjamin Harrison for instruction, Major John W. Turner, Oak Forest; Capts. Roy H. Garm, Beardstown; Lorin C. Collins, Chicago; Henry G. G. Schmidt, Elgin; Bernard M. Conley, Wilmette; Lieuts. William C. Cotton, Benson, Ill.; Robert A. Noble, Bloomington, Ill.; Henry S. Zimmerman, Cameron, Ill.; Everett P. Coleman, Canton, Ill.; Ira McKinney, Champaign, Ill.; Norman S. Starr, Charleston, Ill.; Walter E. Bourque, Chicago; Maurice W. K. Byrne, Chicago; Mandel A. I. Cohen, Chicago; William De Boer, Chicago; Karl J. Henrichsen, Chicago; Emery T. Isacowitz, Chicago; Robert R. Kirkpatrick, Chicago; Anthony J. Linowiecki, Chicago; Gilbert M. Loewe, Chicago; Gottlieb A. Lurie, Chicago; Harry G. Martin, Chicago; Frank R. Maurer, Chicago; Clarence McClellan, Chicago; Guy M. McLean, Chicago; Theodore E. Miller, Chicago; Eugene A. Moulton, Chicago; David V. Omens, Chicago; Hans A. Paulsen, Chicago; Ralph W. Petersen, Chicago; Louis W. Pijan, Chicago; Irving A. Porges, Chicago; Carl G. Rydin, Chicago; Samuel Sullivan, Chicago; George C. Tallerday, Jr., Chicago; Adolph M. Teixler, Chicago; George B. Wallace, Chicago; Warren O. Wheelock, Chicago; Theodore M. Wiersen, Chicago; Edward Buckman, Chicago; George W. Cusick, Chicago; Louis Savitsky, Cicero, Ill.; Frank A. Stockdale, Coal City, Ill.; James R. Tweedy, Cobden, Ill.; Raymond E. Hillmer, Crescent City, Ill.; Charles J. Davis, Deerfield, Ill.; Walter A. Day, Fosterburg, Ill.; Clair L. Stealy, Freeport, Ill.; Frederick C. Vogt, Gillespie, Ill.; Osmon C. Church, Glen Carbon, Ill.; Harry D. Wiley, Glencoe, Ill.; Paul G. Capps, Herrin, Ill.; Elza F. Tate, Homer, Ill.; Oscar George Culli, Ina, Ill.; Augustus S. Hunt, Jerseyville, Ill.; Hayden F. Threlkfeld, Jerseyville, Ill.; Joel E. Toothaker, Ladd, Ill.; William E. Mercer, Liberty, Ill.; Ralph E. Kleckner, Mattoon, Ill.; George C. Shockey, Melrose Park, Ill.; Anson Leroy Nickerson, Momence, Ill.; Charles J. Poole, Mt. Vernon, Ill.; Ralph S. Sabine, Murphysboro, Ill.; Raymond C. Gillogly, Newmann, Ill.; Marshall Wallis, Normal, Ill.; Arthur K. Spiering, Oak Park, Ill.; Ralph G. Cressman, Oglesby, Ill.; Corwin S. Mayes, Olliopolis, Ill.; John O. Gaston, Park Ridge, Ill.; Harry E. Brown, Peoria, Ill.; James F. Hilgenberg, Pesotum, Ill.; Loran E. Orr, Petersburg, Ill.; Alonzo B. Middleton, Pontiac, Ill.; Orin R. Wakefield, Princton, Ill.; Harry S. Seiwell, Quincy, Ill.; William E. Park, Rockford, Ill.; Robert B. Miller, Rock Island, Ill.; Ford C. Walsh, Rock Island, Ill.; Benjamin D. Mosher, Serena, Ill.; William D. Chapman, Silvis, Ill.; Clausen M. Wilmot, Speer, Ill.; Ora M. Williamson, Sullivan, Ill.; Asa L. T. Williams, Vandalia, Ill.; Thomas W. Morgan, Virden, Ill.; Clarence W. Chapin, Weldon, Ill.

To Ft. Des Moines, Ia., and report to the commanding officer of that post for duty as chief of the medical service at the base hospital, Capt. Herbert H. Frothingham, Chicago.

To Fort Riley, for duty at Base Hospital, Lieut. Edmon E. Richardson, Mattoon.

To Fort Sheridan, Ill., from duty at Camp Grant, and report for duty to the commanding general, Capt. Theodore S. Proxmire, Lake Forest.

To Washington, D. C., St. Elizabeth Hospital for course of study in his specialty, Lieut. Harry A. Durkin, Peoria.

To his home from Fort Oglethorpe on account of being physically disqualified, Lieut. James A. Emmons, Pinkstaff.

Par. 26, War Dept., July 30, 1917, as relates to Lieut. George D. Guca, Chicago, is revoked.

INDIANA

To Boston, Mass., for a course in orthopedics and on completion of this course to proceed to Post Graduate Hospital, New York, for further instruction, Lieut. Louis A. Bolling, Attica.

To Fort Benjamin Harrison for instruction, Lieuts. Aaron M. Winklepleck, Alfordsville, Ind.; George C. Taylor, Clay Pool, Ind.; Harry H. Ward, Coalmont, Ind.; Homer H. Tallman, Culver, Ind.; Walter W. Wright, Edinburg, Ind.; Warren Wilburn Hewins, Evansville; Reavill M. Walden, Evansville; Ben Webster, Kingsbury, Ind.; Frederick A. Henderson, Kokomo, Ind.; Byron J. Peters, Kokomo, Ind.; Manford M. Clapper, Lafayette, Ind.; Carlos C. Rozelle, La Grange, Ind.; Benjamin T. Teaford, Lanesville, Ind.; James O'Dell Rhea, Linden, Ind.; Otto H. Swantusch, Metz, Ind.; Irving A. Whitlach, Milan, Ind.; Lloyd H. Simmons, Millersburg, Ind.; Earl L. Waite, Rochester, Ind.; Ora L. McCoy, Romney, Ind.; Tony E. Hunter, Versalles, Ind.; Espy K. Schurtz, Waterloo, Ind.

So much of Par. 34, War Dept., Aug. 30, 1917, as relates to Lieut. Lawrence E. Jewett, Wabash, is revoked.

IOWA

To Army Medical School, Washington, D. C., for instruction, Lieuts. William H. Jenks, Jr., Tipton.

To Fort Benjamin Harrison for instruction, Lieuts. Robert S. Moth, Council Bluffs; Robert B. Stephenson, Libertyville; John C. Crane, Varina.

To Washington, D. C., St. Elizabeth Hospital, for course of study in his specialty, Lieut. Percy B. Battey, Independence.

Honorably discharged from Fort Riley, Lieut. Corvus C. Lang, Altoona.

KANSAS

To Camp Pike, Little Rock, Ark., for duty with Ambulance Co. No. 44, Lieut. David C. Munford, Montezuma.

To Fort Benjamin Harrison for a course of instruction, Lieut. Paul C. Carson, Ashland.

To Fort Leavenworth, Kan., for duty as ophthalmologist and otolaryngologist in the Post Hospital, Capt. John L. Fryer, National Military Home.

KENTUCKY

To Army Medical School, Washington, D. C., for instruction, Lieuts. Floyd K. Foley, Central City; Nona B. Ellis, Lynnville.

To Fort Des Moines, Ia., for instruction, Lieut. William H. Smith, Louisville.

To Fort Riley, for duty as Chief of the Surgical Service, Capt. Frank T. Fort, Louisville.

To Phipps Clinic, Baltimore, Md., for a course of study in his specialty, Capt. Walter A. Lackey, Hopkinsville.

Honorably discharged from Fort Riley, Capt. William A. Poole, Henderson.

LOUISIANA

To Army Medical School, Washington, D. C., for instruction, Lieut. Henry T. Simon, New Orleans.

To Fort Des Moines, Ia., for instruction, Lieut. Aaron W. Brazier, Slidell.

Letter from War Dept., Sept. 18, 1917, No. 4249, as relates to Lieut. Neely M. Palmer, Leesville, is revoked.

MAINE

To Fort Benjamin Harrison for instruction, Lieuts. Henry K. Stinson, Augusta; Ralph W. Wakefield, Bar Harbor; William J. Young, Orono; Edward L. Sollima, Portland; Preston W. Whitaker, Unitz; Bernard A. Bailey, Wiscasset.

MARYLAND

To Camp Meade, Annapolis Jct., Md., for duty as tuberculosis specialist and assistant to the Army Medical Staff, Capt. Gordon Wilson, Baltimore.

To Fort Benjamin Harrison for instruction, Lieut. Frederick W. Wastell, Jr., Harbor Beach.

To Walter Reed General Hospital, from Fort Myer, Va., for a course of instruction in tuberculosis examinations, Lieut. Charles W. Rauschenbach, Baltimore.

To Washington, D. C., and report in person to the Surgeon General of the Army for duty in the section of surgery of the head, Major James Bordley, Jr., Baltimore.

Par. 80, War Dept., June 2, 1917, so much as relates to Major John A. Clark, Takoma Park, is revoked.

MASSACHUSETTS

To Boston State Hospital, Boston, Mass., for a course of study in their specialty, Lieuts. William T. Rumage, Arlington; George B. Wilbur, Newton.

To Camp Logan, Houston, Tex., from Psychopathic Hospital, Boston, Mass., to make examinations in his specialty, Lieut. Raoul G. Provost, New Bedford.

To Camp Meade, Annapolis Jct., Md., from Fort Benjamin Harrison and report in person to the commanding general 79th Div., for duty with the 23d Engrs., Capt. Timothy F. Goulding, Boston.

To Fort Benjamin Harrison for a course of instruction, Capts. Carlisle Reed, Boston; Charles Dudley, Kingston; Erik St. John Johnson, New Bedford; Charles L. Upton, Shelburne Falls; Lieuts. Louis J. Ullian, Sterling E. Wilhoit, Boston; Henry L. Davis, Lynn; Ridgely F. Hanscom, Newton; John A. Sullivan, Pittsfield; George W. Tully, Southbridge; William L. Connery, Springfield.

To Washington, D. C., and report in person to the Surgeon-General of the Army, for duty in connection with the section surgery of the head, Major Allen Greenwood, Boston.

Par. 204, War Dept., Aug. 22, 1917, as relates to Lieut. William J. McDonald, Brookline, modified so as to relieve him from duty at Fort Snelling, Minn.

MICHIGAN

To Army Medical School, Washington, D. C., for instruction, Lieut. James G. Carr, Detroit.

To Camp Beauregard, Alexandria, La., from Psychiatric Clinic, Ann Arbor, Mich., to make examinations in his specialty, Lieut. George K. Pratt, Flint.

To Camp Shelby, Hattiesburg, Miss., from State Psychopathic Hospital, Ann Arbor, Mich., to make examinations in his specialty, Lieut. Ray S. Moorish, Flint.

To Fort Benjamin Harrison, for a course of instruction, Capts. Clarence M. Williams, Alpena; Edward C. Rumer, Flint; William W. Arscott, Rogers; Lieuts. Frederick S. Baird, Bay City; David D. Todd, Calumet; Edward W. Vis, Central Lake; Benjamin T. Goodfellow, Clio; George G. Rieckhoff, John H. Slevin, Detroit; Walter S. Sharpe, Dowagiac; Horace J. Beel, Grand Rapids; Glenn T. Soule, Henderson; Albert J. Schmaler, Hillman; James Rhines, Laurium; Isaiah Sicotte, Michigamme; Birge C. Swigt, Middleville; Albert R. Tucker, Mohawk; Theodore S. Crosby, Wakefield.

MINNESOTA

To Army Medical School, Washington, D. C., for instruction, Lieut. Henry V. Hanson, New London.

To Camp Mills, Garden City, L. I., for inspection and on completion of this duty to return to his proper station, Major Charles H. Mayo, Rochester.

To Cornell Medical College, New York, for a course of instruction in military roentgenology, Lieut. Albert J. Wentworth, Mankato.

To Fort Benjamin Harrison for instruction, Lieut. George H. Norris, Annadale.

To Fort Worth, Tex., from Fort Riley, for duty at the Signal Aviation School, Lieut. Arthur J. Lewis, Henning.

MISSISSIPPI

To Camp Wadsworth, Spartanburg, S. C., from Fort Benjamin Harrison, and report in person to the commanding general for duty, Lieut. Paul X. Browne, Jackson.

Par. 4126, Sept. 15, 1917, War D., as relates to Lieut. Paul Z. Browne, Jackson, is revoked.

MISSOURI

To Chicago, Ill., and St. Louis, Mo., for the purpose of establishing schools of plastic and oral surgery, section of surgery of the head and then to Rockford, Ill., to inspect division of plastic and oral surgery at base hospital, and on completion to return to his proper station, Major Vilray P. Blair, St. Louis, Mo.

To Fort Benjamin Harrison for instruction, Lieuts. Cameron A. Rose, Kansas City; Richard I. Russell, Humansville; Elsworth J. Smith, St. Louis.

To Phipps Clinic, Baltimore, Md., for a course of study in their specialty, Lieuts. William G. Patton, Farmington; Charles H. Burdick, St. Louis.

To Post Graduate Hospital, New York, from Army Medical School, Washington, D. C., for a course in orthopedics, and on completion of this course to proceed to Boston, Mass., for further instruction, Lieut. Lee H. Winemiller, Farley.

Letter, Sept. 20, 1917, No. 4448 War Dept., so much as relates to Lieut. Lee H. Winemiller, Farley, is revoked.

So much of Par. 6, Aug. 18, 1917, as relates to Lieut. Frank N. Wilson, St. Louis, modified as to read for service in the British Heaty Hospital.

NEBRASKA

To Fort Benjamin Harrison for instruction, Lieut. Louis E. Hanisch, Omaha.

To Fort Oglethorpe, for instruction, Lieut. Herman A. Gerbig, Friend.

Letter from War Dept., Sept. 12, 1917, No. 3887, for a course of instruction in military roentgenology in Kansas City, relating to Capt. William H. Mick, Omaha, is revoked.

To New York, N. Y., for instruction in military roentgenology, Capt. William H. Mick, Omaha.

NEW HAMPSHIRE

To Fort Benjamin Harrison for a course of instruction, Capt. Charles A. Sturtevant, Manchester.

To Fort Oglethorpe, from School of Military Roentgenology, Boston, Mass., for instruction, Lieut. Stilman G. Davis, Nashua.

To Fort Benjamin Harrison for instruction, Lieuts. Edmund W. Ill, Solomon J. Sambur, Newark.

To Fort Oglethorpe for instruction, Lieut. Charles L. Davis, South Dayton.

To Post Graduate Hospital, New York, N. Y., for a course of orthopedics, and on completion of this course to proceed to Boston, Mass., for further instruction, Lieut. Frank W. Pinneo, Newark.

Par. 2, War Dept., Sept. 10, 1917, which relates to Lieut. Edgar B. Funkhouser, Trenton, is revoked.

So much of Par. 72 and 73, War Dept. Aug. 27, 1917, as relates to Lieut. Abraham J. Gordon, Newark, is revoked.

NEW YORK

To Army Medical School, Washington, D. C., Lieuts. Wilfred V. Egan, Brooklyn; Fred G. Jones, Clark Mills; Arthur Krida, Schenectady.

To Camp Bowie, Fort Worth, Tex., from Neurological Institute, New York, to make examinations in his specialty, Lieut. John J. Hughes, Mt. Vernon.

To Camp Cody, Deming, N. M., from Psychopathic Hospital, Boston, Mass., to make examinations in his specialty, Lieut. Clarence J. O'Alton, New York.

To Camp Custer, Battle Creek, Mich., from Walter Reed General Hospital, for duty as tuberculosis specialist and assistant to the Army Medical Staff, Lieut. Nelson K. Gromm, Albany.

To Camp Lee, Petersburg, Va., from Walter Reed General Hospital, for duty as tuberculosis specialist and assistant to the Army Medical Staff, Capt. John P. Faber, Schenectady.

To Camp McClellan, Anniston, Ala., from Fort Benjamin Harrison to make examinations in his specialty, Lieut. Frederick C. Devendorf, Utica.

To Camp Mills, Garden City, L. I., from Army Medical School, Washington, D. C., for temporary duty in laboratory, Lieut. Fred. M. Meader, New York.

To Camp Meade, Annapolis Jct., Md., and report in person to the commanding general, 79th Division, for duty with the 23rd Engineers, Capts. Waldemar T. Browne, Brooklyn; for duty in connection with venereal diseases, Faxton R. Gardner, New York City.

To Camp Upton, Yaphank, L. I., for duty, Capt. Frederick P. Hammond, Lieut. Ammi B. Edgar, New York City.

To Camp Wheeler, Macon, Ga., from Buffalo State Hospital, Buffalo, N. Y., to make examinations in his specialty, Capt. Robert King, Buffalo.

To Fort Benjamin Harrison for instruction, Major Frank A. Walder, Lockport; Capts. Otto C. J. Von Renner, Buffalo; Walter H. Vosburg, Dunkirk; Raymond E. Longacre, Lee S. Shoninger, Archibald W. Taves, New York City; John D. Shipmam, Vernon; Lieuts. Summer E. Douglas, Adams; Bryan G. Shults, Albany; Arthur H. Wheeler, Albany; Joseph J. Dunnigan, Auburn; Edward Danforth, Bainbridge; Paul E. Betowski, Bath; George B. Reitz, Brooklyn; August M. Sartorius, Brooklyn; Irving S. Schneikraut, Brooklyn; Morris K. Silberman, Brooklyn; Alexander S. Sim, Brooklyn; Arthur E. McCarthy, Buffalo; Windsor R. Smith, Buffalo; Victor A. Tyrasinski, Buffalo; George H. Shaw, Camillus; Henry S. Edmunds, Cassadago; Walther C. A. Steffen, College Point; Hall G. Van Vlack, Forestville; Maxwell K. Willoughby, Genoa; Henry E. Clarke, Glens Falls; James H. Van Marter, Groton; William M. Sill, Jamestown; Patrick J. Hirst, Middle Grove; Charles A. Smith, New Rochelle; Henry C. Falk, Joseph Haas, Saul L. Meylackson, Isaac Reitzfeld, Charles P. Roach, Jay B. Rudolphy, Harry O. Saunders, William J. Scott, Isadore Seff, Solomon Shlimbaum, Henry B. Siglar, Benjamin J. Slater, Joseph T. Slonimsky, Louis J. Sokol, Oscar Spier, Maurice A. Sturm, Joseph Subkis, Lewis H. Taft, Edward H. Tonolla, Abraham Unger, Henry L. Wonner, Jr., New York City; Hamilton M. Southworth, Old Chatham; Bernard S. Strait, Penn Yan; Roy W. Bury, Philadelphia; Leo R. Tighe, Poughkeepsie; Roy J. Marshall, Le Clare Stuart, Rome; James A. Taggert, George B. Ubel, Salamanca; Stephen J. H. Reed, Sangerties; Leroy D. Sopee, Smyrna; William Trotter, Troy; John Peter Schneble, Wood Haven.

To Fort McPherson, Ga., from Camp Mills, and report to the commanding officer of that post for duty as chief of the medical service at the base hospital, Lieut. Charles N. B. Camac, New York City.

To Fort Oglethorpe for instruction, Lieuts. Johnston MacLeod, Flushing; Arthur G. Pilch, Rochester.

To Neurological School, Philadelphia, Pa., for four weeks' intensive training in brain surgery, Capt. Edwin Beer, New York City.

To Neurological Institute, New York, for a course in his specialty, Lieuts. Vincent W. Weiss, New York City; Samuel W. Hausman, Ogdensburg; Ward W. Millias, Rome.

To Psychopathic Hospital, Ann Arbor, Mich., from Fort Benjamin Harrison, for study in their specialty, Capt. George F. Mills, Oneida; Lieuts. Geoffrey C. H. Burns, Central Islip; Emil Altman, New York City.

To Post Graduate Hospital, New York, for a course of orthopedics and on completion of this course to proceed to Boston, Mass., for further instruction, Major Charles W. Hennington, Rochester; Lieut. William T. Shields, Troy.

To Signal Corps, Aviation School, Hazelhurst Field, from West Point, for duty, Lieut. F. L. Senger, Brooklyn.

To Washington, D. C., and report in person to the Surgeon General of the Army for duty in his office, Major William L. Hart, Madison Barracks; Lieut. Sanger Brown, White Plains.

To be relieved from the duty assigned him by Par. 154, War Dept., Aug. 22, 1917, and return to the inactive list of the M. R. C. of the Army, Major Edward S. Van Duyn, Syracuse.

Now on duty at Plattsburg Barracks, as contract surgeon be ordered to active duty as major, effective Sept. 3, 1917, Major M. S. Gregory, New York City.

To their Homes, Lieuts. Lemuel W. Gorham, Albany; Ambrose A. Scouler, Brooklyn; Abraham Skversky, New York City; John A. Conley, Penn Yan.

NORTH CAROLINA

To Army Medical School, Washington, D. C., for instruction, Lieut. Kelso A. Carroll, Raleigh.

To Camp Beauregard, Alexandria, La., from Camp Wadsworth, Spartanburg, S. C., for duty as Chief of the Surgical Service, Major John T. Burrus, High Point.

To Camp Des Moines, Ia., for instruction, Lieut. William H. Bryant, Henderson.

To Fort Benjamin Harrison for a course of instruction, Lieut. Wilbur G. Jenkins, Raleigh.

Letter, Aug. 31, 1917, No. 3194, War Dept., so much as relates to Lieut. Isaac M. Taylor, Morgantown, is revoked.

Honorably discharged on account of being physically disqualified, Lieut. Isaac M. Taylor, Morgantown.

NORTH DAKOTA

To Kansas City, Mo., for a course of military roentgenology, Lieut. Leslie G. Eastman, Hazen.

OHIO

To Army Medical School, Washington, D. C., for instruction, Lieuts. Maurice L. Allen, Albert L. Jones, Cleveland; Atlee R. Olmstead, Marshallville.

To Boston, Mass., for instruction in orthopedics, Lieuts. Charles M. Paul, Cincinnati; Barney J. Hein, Toledo.

To Camp Taylor, Louisville, Ky., from Cleveland, O., for duty as tuberculosis specialist and assistant to the Army Medical Staff, Capt. Milton J. Lichty, Cleveland.

To Camp Wheeler, Macon, Ga., from Walter Reed General Hospital, for duty as tuberculosis specialist and assistant to the Army Medical Staff, Capt. Samuel Hindman, Columbus.

To Fort Benjamin Harrison for instruction, Capt. Edward D. Sinks, Lima; Lieuts. Clyde K. Startzman, Bellefontaine; Melville D. Saash, Bluffton; Wiley T. Sprague, Chauncey; Walter H. Mytinger, Cincinnati; Samuel Zielonka, Cincinnati; Verner T. Scott, Clarksburg; Adlai E. Callaghan, Cleveland; Paul F. Davidson, Cleveland; Rudolph S. Reich, Cleveland; Ralph H. Sill, Cleveland; John M. Steel, Cleveland; John W. Tippie, Cleveland; James N. Wychgel, Cleveland; Nicholas L. Zinner, Cleveland; Clarence J. Schirack, Coldwater; Elgie R. Shaffer, Columbus; Otto N. Warner, Conneaut; Ivan L. Biggs, Custar; Warde B. Smith, Frankfort; Zalmon O. Sherwood, Geneva; Harry W. Shaw, Junction City; Donald De Costa Shira, Larue; William T. Stewart, Morning Sun; Jaffray J. Vega, National Military Home; Murray E. Reeder, Ohio City; Owen B. Van Epp, Port Clinton; Gale C. Guthrie, Uhrichsville; Edward McD. Cass, Utica; Harvey N. Trumbull, Woodville; David B. Phillips, Youngstown.

To Neurological Institute, New York, N. Y., for a course of study in his specialty, Lieut. John C. George, Dayton.

OKLAHOMA

To Camp Bowie, Ft. Worth, Tex., for duty, Lieut. Albert N. Earnest, Muskogee.

To Fort Worth, Tex., from Fort Riley, for duty, Lieut. Ross D. Long, Oklahoma.

OREGON

To Washington, D. C., and report to the Chief of Staff for temporary duty Army War College, and relieved from duty with the 42d Division, Camp Mills, L. I., Lieut. Spiro Sargentich, Portland.

PENNSYLVANIA

To Army Medical School, Washington, D. C., for instruction, Lieuts. Don C. Kyper, John R. T. Snyder, Altoona; Torrance J. Hanlon, Donora; Harry C. Fulton, Lancaster; Ralph E. Conn, Monessen; Harry F. Bailey, Monongahela; Humbert A. Granelli, David W. Kramer, Philadelphia; Galen D. Castleburg, Ralston; Valentine B. Eiler, Titusville.

To Boston, Mass., for instruction in orthopedic work and on completion of this course to proceed to New York (N. Y.) Post Graduate Hospital for further instruction, Lieuts. Ralph L. Rutledge, McKeesport; Robert E. Davison, James L. Gilmore, Pittsburgh.

To Camp Hancock, Augusta, Ga., from Phipps Psychopathic Clinic, Baltimore, Md., to make examinations in his specialty, Lieut. George P. Ard, Woodward.

To Camp Mills, Garden City, L. I., for duty with 42d Div., Major George S. Crampton, Philadelphia.

To Camp Shelby, Hattiesburg, Miss., from Fort Oglethorpe, for temporary duty to conduct cardiovascular examinations, Lieut. John H. Musser, Jr., Philadelphia.

To Fort Benjamin Harrison for a course of instruction, Lieuts. Eugen G. Reinartz, Solon L. Rhode, Charles A. White, Philadelphia; Howard L. Farquhar, Pittsburgh; Harry E. Garman, Spangler.

To Walter Reed Hospital, Tacoma Park, D. C., and report in person to commanding officer for special instruction in tuberculosis examinations, Lieut. William C. Spalding, Cresson.

To Washington, D. C., and report in person to the Surgeon-General of the Army for temporary duty in that office, Lieut. Floyd E. Keene, Philadelphia.

Par. 4223, Sept. 19, 1917, War Dept., as relates to Lieut. Alexander H. Colwell, Pittsburgh, is revoked.

To his home from Fort Niagara, N. Y., Lieut. David Riesman, Philadelphia.

PHILIPPINE ISLANDS

To Camp Pike, Little Rock, Ark., for duty with Ambulance Co. No. 44, Lieut. Seth L. Cox, Atimonan.

RHODE ISLAND

To Camp Upton, Yaphank, L. I., from Walter Reed General Hospital, for duty as tuberculosis specialist and assistant to the Army Medical Staff, Capt. James L. Wheaton, Pawtucket.

To Fort Benjamin Harrison for instruction, Lieut. Michael H. Scanlon, Westerly.

To Fort Oglethorpe, from school of Military Roentgenology, Boston, Mass., for instruction, Lieut. Jacob S. Kelley, Providence.

TENNESSEE

To Army Medical School, Washington, D. C., for instruction, Lieut. Clarence H. Glover, Memphis.

To Fort Benjamin Harrison for instruction, Lieut. Charles A. Robertson, Ridgetop.

To Fort Des Moines, Ia., for instruction, Lieut. Jonathan N. Rucker, Gallatine.

TEXAS

To Camp Kearny, Linda Vista, Calif., to make examinations in his specialty, Lieut. James W. Hill, Dallas.

To Fort Benjamin Harrison for instruction, Lieut. Wallace B. Guinn, Tivoli.

To Fort Des Moines, Ia., for instruction, Lieut. Allen A. McDonald, Calvert.

To Watertown, N. Y., from Army Medical School, to inspect ambulance bodies, Major Harold W. Jones, San Antonio.

VERMONT

To Camp Meade, Annapolis Jct., Md., from Fort Sheridan, Ill., for duty, Lieut. Horatio N. Jackson, Burlington.

VIRGINIA

To Army Medical School, Washington, D. C., for instruction, Lieut. Rockwell E. Smith, Crozet.

To Camp Green, Charlotte, N. C., from Neurological Institute, New York, N. Y., to make examinations in his specialty, Lieut. Paul V. Anderson, Richmond.

To Fort Benjamin Harrison for instruction, Lieuts. George B. Harrison, Colonial Beach; Robert J. Styers, Jetersville; John H. Hare, Newland; Ira Hurst, Parksley; Granville Eastham, Rapidan; Robert E. Timberlake, Junius E. Warinner, Richmond; Ernest H. Muse, Roanoke.

To Rockefeller Institute for Medical Research, New York, N. Y., for a course of instruction in laboratory work, Capt. Erasmus G. Hopkins, Richmond.

WASHINGTON

To Los Angeles, Calif., for a course of instruction in military roentgenology, Lieut. Roy C. Baumgarten, Seattle.

To Mineola, Long Island, for the purpose of making inspection of the aviation camp, Col. George H. Crabtree, Fort Lawton.

WEST VIRGINIA

To Fort Benjamin Harrison for instruction, Lieuts. George W. Shriver, Clendenin; James O. Hicks, Huntington; Charles G. Willis, Kingston; Frank C. Shafer, Roanoke; Harry R. Parker, Williamson.

WISCONSIN

To Boston State Hospital, Boston, Mass., from Fort Riley, for a course of study in his specialty, Lieut. Charles C. Rowley, Winnebago.

To Camp Meade, Annapolis Jct., Md., from Fort Sheridan, Ill., for duty, Lieut. Ralph Kayeen, Oconomowoc.

To Phipps Clinic, Baltimore, Md., for a course of study in his specialty, Lieut. William J. Fleming, Wauwatosa.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ILLINOIS

Rosenow in Rock Island.—At a special meeting of the Rock Island County Medical Society, held in Rock Island, September 27, the essayist of the evening was Dr. Edward C. Rosenow, Rochester, Minn., who spoke on "Infantile Paralysis."

Personal.—Drs. William E. Buehler and Andrew M. Harvey, Chicago, have been elected directors of the public safety commission in Cook County.——Dr. Clara E. Hayes of the Peoria State Hospital has been appointed superintendent of the State Training School for Girls, Geneva.

Work for the Insane.—On account of the shortage of knit underwear and stockings due to the war, the state welfare commission has determined on installing the machinery at the Elgin State Hospital for making needed articles of clothing, as well as brooms, brushes, furniture and shoes.

Sanitary Assignments.—Dr. C. St. Clair Drake, Springfield, director of the public health of the state, has announced the following assignments: Dr. Clarence W. East, Evanston, detached from Camp Grant, Rockford, to investigate poliomyelitis in Cook County; Dr. Arthur Pearman, medical health officer for Camp Grant health district; Dr. Alexander F. Stewart, Oneida, health officer for the Western District; John A. Kappelman, Evanston, relieved as medical officer of the Fort Sheridan District, excepting special assignments, and detailed to the Northwest Health District, with headquarters in Chicago; Major John A. Robison, M. R. C., U. S. Army, medical officer for the Fort Sheridan health district, and Dr. Charles E. Crawford, assigned to supervision of the Northwestern health district, Rockford.

Chicago

Personal.—Dr. Clarence W. Leigh has been appointed city physician, succeeding Dr. Michael J. Purcell.——Dr. James M. Neff, who was on duty with the Murphy Unit in Europe for several months, has returned and resumed practice.

One Million Dollars for Hospital.—At the November election, the people of Cook County will be asked to approve a bond issue of $1,000,000 for the erection of two hospitals as branches to Cook County Hospital. The first, to accommodate 200 patients, is asked for South Chicago, and the second, in the stock yards district, is intended as an emergency hospital.

Poliomyelitis.—September 28, there were said to be 155 cases of infantile paralysis in Chicago and between forty and fifty cases in Cook County outside of the city. Eleven new cases, with four deaths, were reported in Chicago for the date mentioned. According to a statement of the health commissioner, 50 per cent. of the cases in the present epidemic had proved fatal. Seventeen meetings were held in as many schoolbuildings of the city on the date mentioned at which physicians gave talks to more than 12,000 citizens on the disease and measures for its prevention.

Military Assignments.—Major Harry D. Orr, M. C., assigned to the One Hundred and Twenty-Second Infantry, has been appointed director of Illinois field ambulance companies. Capt. Robert J. Gay has succeeded Major Orr as regimental surgeon.——Major William J. Swift, M. C., has been appointed director of Illinois field hospital companies at Camp Logan, Houston, Texas.——Dr. Cassius C. Rogers has been commissioned major, and Dr. J. Lloyd Hammond, lieutenant, in the Medical Corps, Illinois National Guard, and assigned to the First Reserve Infantry.——Dr. Maurice L. Blatt has been commissioned major, and Dr. Arthur H. Parmelle, lieutenant, in the Medical Corps, and assigned to duty with the Second Illinois Reserve Infantry.

INDIANA

Personal.—Dr. William Shiner, superintendent of the Pathological Laboratory of the Indiana State Board of Health, has been offered the professorship of pathology in the University of Texas.——Dr. Daniel F. Randolph, Waldron, has entered St. Vincent's Hospital, Indianapolis, on account

of injuries received in the overturning of his automobile recently.

State Society Meeting.—The Indiana State Medical Society met in Evansville, September 26, 27 and 28, and elected the following officers: Dr. Joseph R. Eastman, Indianapolis, president; Drs. Victor V. Cameron, Marion; Harvey H. Martin, Laporte, and Eugene A. Sturm, Jasper, vice presidents, and Dr. Charles N. Combs, Terre Haute, was reelected secretary-treasurer. It was voted unanimously to hold the 1918 meeting in Indianapolis.

IOWA

Poliomyelitis.—What appeared to be a new outbreak of poliomyelitis in Davenport occurred, September 25, when three new cases were reported in the preceding twelve hours. In an effort to check the epidemic in Davenport the health authorities made a regulation, September 20, that no mail would be allowed to go out from homes quarantined on account of the disease, and the postal authorities acquiesced in the rule and returned mail from such houses.

MARYLAND

Typhoid Fever Epidemic.—An epidemic of typhoid fever has broken out at Arlington, Baltimore County. To date there are fourteen cases of the disease, among them five in one family and six in another. Dr. Henry A. Naylor, Pikesville, who is health officer of the district, reported the cases to the state board of health.

Personal.—Dr. Thomas B. Futcher, Johns Hopkins Hospital, will sail shortly for England, where he will be in charge of the Canadian Military Hospital at Orpington, Kent. Although Dr. Futcher has been living in Baltimore for many years, he is a British subject, being a Canadian by birth. He has been commissioned a lieutenant-colonel in the Canadian Expeditionary Force.

MONTANA

Hospital Addition Completed.—A twenty-room addition has been made to the Park Hospital, Livingston, at a cost of $20,000. The hospital now has a bed capacity of fifty.

Personal.—Dr. William C. Riddell, Helena, has been commissioned major, M. C., Mont. N. G., and assigned to the Second Infantry.——Dr. Michael J. Casserly, Hamilton, who is on duty with the Canadian Army Medical Corps in France, has been wounded.——Dr. James H. Irwin, Great Falls, has been commissioned major, and ordered to duty at American Lake, Washington.

Epidemic Diseases.—Since January, only twenty-four cases of infantile paralysis have been reported to the state health authorities. This compares favorably with 1916, when 108 cases were reported during the same period. During September, twelve cases of smallpox were reported in Livingston. ——In Butte, fifteen cases of smallpox were reported during the first half of September.

NEW YORK

Personal.—Dr. Charles G. Wagner, superintendent of the Binghamton State Hospital, is reported to be seriously ill at his home.——Dr. Moses Rosenberg, Rochester, surgeon on the British steamer *Verdi*, which was reported to have been sunk by a German submarine, was saved.

New Officers.—At the annual meeting of the Eighth District Branch of the Medical Society of the State of New York, held at Buffalo, September 13, the following officers were elected: president, Dr. Albert T. Lytle, Buffalo; vice presidents, Drs. Edward Torrey, Olean, and William R. Thomson, Warsaw; secretary, Dr. Lyman C. Lewis, Belmont, and treasurer, Dr. Fitch H. Van Orsdale, Belmont.

Quarantine at Camp Mills.—The Forty-Second Division of the National Guard Army encamped near Mineola, L. I., is threatened with an outbreak of cerebrospinal meningitis. Dr. Fred M. Meader of the Surgeon-General's Office, who has been sent to the camp to handle the situation, has established three quarantines. Cultures taken in the One Hundred and Sixty-Seventh Infantry have shown a number of meningitis carriers. These have been isolated, and no further spread of the malady is anticipated. There was one death in the regiment which lead to the investigation.

New Vital Economics Department at Rochester.—The University of Rochester is organizing a department, to be known as the Department of Vital Economics, as an extension of the Department of Household Economics of the Mechanic's Institute. The course will be arranged with a view to preparing young men and women for more rational physical living and to the training of students for positions in public health offices. Dr. John R. Murlin, who for the past eight years has been professor of physiology in the Medical School of Cornell University, has been appointed director. This department, the first of its kind in this country, has been made possible by a bequest of $800,000 made available by the will of Lewis P. Ross, the income of which may be used "to the end that human life may be prolonged with increased health and happiness."

Civil Service Examinations.—The civil service commission announces that examinations will be held, November 3, to fill the following positions:

Assistant bacteriologist, state department of health; open to men and women; salary $1,200 to $1,800; ages 21 to 35 years; candidates must have a thorough knowledge of the principles of bacteriology, and considerable practical experience in that work, including preparation of purified antitoxins.

Assistant physician, regular or homeopathic, to provide eligibles for positions as assistant physician in the state hospitals and other positions of a similar nature; salary $1,200 to $1,600, with maintenance; open to men and women, licensed medical practitioners of New York; graduates from a registered medical school, and with at least one year's experience on the resident medical staff of a hospital, or medical intern or clinical assistant in a state hospital, or three years' consecutive practice of medicine.

Applications should be made to the State Civil Service Commission, Albany, prior to October 22.

New York City

New York Academy of Medicine.—The meetings of the New York Academy of Medicine for the season 1917-1918 began on the evening of October 4 with an address by Dr. Alexis Carrel on "Principles of the Treatment of Wounds."

Mental Examination of Troops.—The work of making a mental examination of the men in the Twenty-Seventh Division has been begun by Lieut. Samuel Leopold, formerly of the University of Pennsylvania, who has just completed work of this kind in the Pennsylvania National Guard.

Institution for Feebleminded Children.—The cornerstone of the first of a group of eleven buildings, to be known as the Institution for Feebleminded Children, which the Department of Charities is erecting on Randall's Island, was recently laid with appropriate ceremonies. The principal speakers were Mayor Mitchell and Commissioner of Charities John A. Kingsbury.

Draft Board Doctor on Trial.—The trial of Dr. Henry Seligman, a volunteer examining physician for District Board 52, charged with accepting a bribe to release a conscript from military service, was recently reached. The testimony produced by the regular physicians on the board show that the defendant had examined and found unfit for service a man who, on reexamination, easily passed all physical tests.

Columbia University Opens.—The respective institutions of Columbia University opened their doors for the year 1917-1918 by the usual addresses. Among the most notable of these was that of Prof. Hans Zinsser, who made the opening address for the medical school. His theme was "Opportunities for National Service," and his summary is characterized as a suitable profession of faith for loyal Germans in this country.

Springs Cause Typhoid Fever in New York.—The search for the source of a small outbreak of typhoid fever in the Bronx has led to the discovery that the infection was probably transmitted by the drinking of water from an infected spring fed by drainage from fertilized fields in the vicinity. Laboratory tests of the water of several other springs in that section of the city indicate that it is unsafe for drinking. The department of health has placarded a number of these springs as unfit for drinking purposes, and has issued a warning against drinking the water from springs within the city limits.

OHIO

Schools Ordered Closed.—The public and parochial schools of East Liverpool, which opened September 10, were ordered closed for one week on the discovery of two cases of anterior poliomyelitis.

Poliomyelitis.—Opening of the Mansfield schools was postponed until September 17 on account of the fear of the spread of poliomyelitis.——At Wooster a similar postponement was had. September 6, only two patients remained under treatment.——In Cleveland eighteen cases have been treated since June 1, none of them proving fatal.

Academy Meeting.—At the meeting of the Cleveland Academy of Medicine, September 28, Lieut.-Col. Ethelbert B.

Hardy, D. S. O., in command of the Military Base Hospital, Toronto, narrated "Experiences of Medical Officers at the Front," and Lieuts. Benjamin R. McClellan, Xenia, and Murray B. McGonigle, Toledo, spoke on "The Medical Department of the Army."

Schoolteachers Subnormal Physically.—At Cincinnati, twenty-four of the forty-two schoolteachers who took the physical examination for positions in the public schools were found to be underweight. None was rejected; one was conditioned on account of defective vision and six others were advised to consult oculists; two were found to have impaired hearing, and one, diseased tonsils.

Sanatorium Capacity Doubled.—The capacity of the Warrensville Tuberculosis Sanatorium has been doubled since January 1 of last year. The present capacity of the institution is 390. The Children's Colony can admit forty-five more patients than before, and by the remodeling of two old structures accommodation has been provided for sixty additional adults. Three more cottages, with the capacity of twenty each, will be completed within a few weeks.

Personal.—Dr. Charles F. Hoover, Cleveland, assistant director of Lakeside Base Hospital No. 4, has returned on leave of absence.——Dr. O. van der Stricht, Ghent, Belgium, for the last two years fellow in Cytology in the Anatomical Laboratory of Western Reserve University, Cleveland, has been appointed lecturer in anatomy in the Johns Hopkins University, Baltimore.——Dr. Carell S. Mundy, superintendent of the Toledo Contagious Disease Hospital, has resigned to enter the Army medical service.——Dr. Clarence D. Selby, Toledo, has resigned as commissioner of public health, and Dr. Charles Dreyer, city physician, has been appointed his successor.——Dr. Burt A. Marquand, Dover, suffered fracture of several ribs in a collision between his automobile and an interurban car.——Dr. Sterling H. Ashum has been appointed city physician of Dayton, succeeding Dr. Daniel G. Reilly, deceased.——Dr. William K. Ruble, Martinsville, has been elected treasurer of Clinton County. ——Dr. Ralph A. Bunn, Dayton, has been appointed assistant chief surgeon at the Dayton Soldiers' Home.——Dr. Roy E. Bushong, Athens, has been appointed acting superintendent of Athens State Hospital during the absence, on leave, of Dr. Ora O. Fordyce.

PENNSYLVANIA

Dysentery Epidemic.—An epidemic of dysentery is reported in the townships on the west side of the Susquehanna River. In Larksville and Plymouth there are reports of 295 persons ill with the disease, with, thus far, fifteen deaths.

Personal.—Dr. Arthur A. Woods, Erie, has moved to California.——Dr. Henry L. Orth announces his approaching retirement, after twenty-seven years' service, as superintendent of the Pennsylvania State Lunatic Hospital.

New Officers.—At the annual meeting of the Seventeenth Censorial District Medical Association, held in Sunbury, September 6, Dr. John W. Bruner, Bloomsburg, was elected president of the Pennsylvania State Lunatic Hospital, Harrisburg.

Branch County Society Organized.—The physicians from the northern portion of Washington County met in Burgettstown, September 14, and organized the Nothern Branch of the Washington County Medical Society, and elected Dr. Audley O. Hindman, president.

Officers Elected.—At the recent meeting of the Pennsylvania State Medical Society, the following officers were elected: president, Dr. Frederick L. Van Sickle, Olyphant; vice presidents, Drs. Walter F. Donaldson, Pittsburgh; Benjamin F. Royer, Harrisburg; David N. Dennis, Erie, and Walter J. Leaman, Lancaster; secretary, Dr. Cyrus L. Stevens, Athens; assistant secretary, Dr. Christian B. Longenecker, Philadelphia; treasurer, George W. Wagoner, Johnstown; trustees, Ira G. Shoemaker, Reading; Frank G. Hartman, Lancaster; Harry W. Albertson, Scranton; Spencer M. Free, Dubois; Donald Guthrie, Sayre, and Jay B. F. Wyant, Kittanning.

Philadelphia

Personal.—Lieut. Howard F. Keating, on duty on the western front, was slightly wounded during the air raid of September 24.

University of Pennsylvania Opening Exercises.—The University of Pennsylvania opened its 177th college year in Weightman Hall, September 28, with a student body much depleted by enlistments for the war. About 60 per cent. of the old students were missing, although the freshman class is larger than ever. The medical department has an exceptionally large entering class. In spite of the large number from the department who enlisted, the total enrolment of medical students is increased. A number of changes have been made. In the medical school, Drs. Joseph McFarland, Horatio C. Wood, Jr., John C. Heisler and Seneca Egbert have been added to the faculty. Dr. Allen J. Smith takes the place of Dr. William Pepper as dean.

UTAH

Smallpox.—During the week ending September 15, ten cases of smallpox were reported in Salt Lake City.——Lark is under strict quarantine on account of smallpox.

Called to California.—Dr. Daniel H. Calder, for many years superintendent of the State Mental Hospital, Provo, has been appointed a member of the faculty of the Medical College of the University of Southern California, Los Angeles, and a member of the staff of the Los Angeles County Hospital.

State Association Meeting.—The twenty-third annual meeting of the Utah State Medical Association was held at the Hotel Utah, Salt Lake City, September 12-14, under the presidency of Dr. Samuel C. Baldwin, Salt Lake City. Salt Lake City was selected as the place of meeting for 1918, and the following officers were elected: president, Dr. Frederick Stauffer, Salt Lake City; vice presidents, Drs. Andy J. Stewart, Provo; Edward I. Rich, Ogden, and Ernest Van Cott, Salt Lake City; secretary, Dr. W. Brown Ewing, Salt Lake City (reelected); treasurer, Dr. Francis A. Goeltz, Salt Lake City; councillor, Eugene H. Smith, Ogden; delegate to the American Medical Association, Dr. Thomas J. Howells, Salt Lake City, and alternate, Dr. Joseph R. Morrell, Ogden. Among the features of the meeting were the illustrated lecture by Dr. Richard C. Corwin, Pueblo, Colo., on "War Surgery in France and America," in which he detailed the Carel-Dakin treatment of wounds, and the address of Dr. Palmer Findley, Omaha, on "Obstetrics as a Lost Art."

WISCONSIN

Typhoid Fever at Marshfield.—During the week ending September 15, twenty-six cases of typhoid fever were reported to the health officers of Marshfield.

Tuberculosis Board Appointed.—The Surgeon-General has appointed a tuberculosis commission which is making a survey of the troops at Camp Robinson, near Sparta. The personnel of the commission is as follows: Drs. Arthur J. Patek, Lawrence G. Sykes, J. Gurney Taylor, James D. Madison and William B. Ford.

Sanatorium Items.—The issue of bonds for $40,000 for the addition to Blue Mound Sanitarium has been approved by Judge C. B. Woods.——Work has been commenced on the infirmary building of the Madison Anti-Tuberculosis Association. The general contract has been let for $6,775. The infirmary will be a frame structure, two stories in height, and 36 by 60 feet.

Personal.—Dr. Frank H. Turner, Frederic, is reported to be ill with pneumonia.——Drs. Raymond G. Arveson and John Diamond have leased the Frederic Hospital to the Sisters of St. Joseph, Superior.——Health Commissioner George C. Ruhland, Milwaukee, has resigned, and has been called to duty at Fort Sill. The employees of the department presented Dr. Ruhland with an alligator writing case and a gold wrist watch.

Changes of Name of Public Institutions.—The following changes in the names of public institutions in Milwaukee County were recently announced: Milwaukee County Alms House to Milwaukee County Infirmary; Milwaukee County Home for Dependent Children to Milwaukee County Home for Children; Milwaukee County Hospital for Acute Insane to Milwaukee County Hospital for Mental Diseases; Milwaukee County Asylum for Chronic Insane to Milwaukee County Asylum for Mental Diseases.

Acts Passed by Last Legislature.—The legislature, during its last session, passed the following bills to strengthen the facilities of the state in its fight against tuberculosis: An act appropriating $15,700 for the erection of a cottage, workshop and electric plant at Tomahawk Lake Camp, and $15,000 for a refectory and employees' building at the camp; an act appropriating $75,000 for the erection of a new state sanatorium in northern Wisconsin, and an act increasing the

state aid for patients in county tuberculosis sanatoriums from $125,000 to $141,000 for the first year of the biennium, and $165,000 for the second year.

Vigilance Committee Advised.—The Wisconsin Antituberculosis Association urges the appointment of a citizens' tuberculosis vigilance committee in every community, the duties of which shall be to request examining boards to obtain records of all active and suspected cases of tuberculosis, to secure the volunteer services of physicians to whom the board examiner may refer all suspected and borderline cases for more thorough examination; to secure proper care and instruction of the patient by the follow-up system, and to assist, where necessary, in securing additional sanatorium facilities for the care of these cases and of others, with special reference to returned soldiers.

Hospital Notes.—The directors of the Plymouth Hospital announce the opening of that institution, October 1. The hospital will accommodate thirty-five patients.——The new Riverview Hospital, Grand Rapids, erected at the cost of $25,000, was opened for public inspection, September 4. The building is two stories and basement in height, 75 by 81 feet, and is thoroughly equipped.——The Winnebago County Medical Society and the Oshkosh Medical Club have endorsed the plan of Lakeside Methodist Hospital Company, to take over and operate Lakeside Hospital.——Dr. Sylvester G. Pake, formerly of Superior, has moved to Hayward, where he has leased the parochial school building, which is being remodeled for a hospital.

GENERAL

National Board Examination.—The National Board of Medical Examiners will hold its next examination in Chicago, October 10 to 18, inclusive. About sixty-five physicians have applied. Others who desire to take the examination should apply at once to the secretary, Dr. John S. Rodman, 2106 Walnut Street, Philadelphia.

Bequests and Donations.—The following bequests and donations have recently been announced:

Faculty of Medicine, McGill University, Montreal $500,000; Montreal General Hospital, $500,000; Montreal Maternity Hospital, $100,000, and Royal Institute for the Advancement of Learning (McGill), for MacDonald College, $1,000,000, by the will of Sir William MacDonald, Montreal, Chancellor of McGill University.

Mount Sinai Hospital, New York, $100,000, to be used for the purpose of Cancer Research Work, by the will of Julian A. Hillman.

Tri-State Physicians Elect Officers.—At the annual meeting of the Tri-State District Medical Society, held in Dubuque, September 5, the following officers were elected: president, Dr. William B. Peck, Freeport (reelected); honorary president, Dr. James R. Guthrie, Dubuque; vice presidents, Drs. Clarence A. McGuire, Dubuque; Edwin S. Gillespie, Wenona, Ill., and Lawrence H. Prince, Madison, Wis., and secretary-treasurer, Dr. Nelson C. Phillips, Freeport, Ill. (reelected).

New Officers for Missouri Valley Society.—At the thirtieth annual meeting of the Medical Society of the Missouri Valley, held in Lincoln, Neb., September 20 and 21, the following officers were elected: president, Dr. Artemas J. MacKinnon, Lincoln, Neb.; vice presidents, Drs. Thomas M. Paul, St. Joseph, Mo., and Paul E. Gardner, West Hampton, Iowa; secretary, Dr. Charles Wood Fassett, Kansas City, Mo. (reelected for the sixteenth term), and treasurer, Dr. Oliver C. Gebhart, St. Joseph, Mo. Omaha was selected as the next place of meeting.

Negro Professional Men Elect Officers.—At the annual meeting of the National Medical Association, composed of colored physicians, dentists and pharmacists, held in Philadelphia, August 29 and 30, the following officers were elected: president, Dr. George A. Cabaniss, Washington, D. C.; president elect, Dr. D. A. Ferguson, D. D. S., Richmond, Va.; vice presidents, Drs. Henry M. Green, Knoxville, and John P. Turner, Philadelphia; chief secretary, Dr. Walter G. Alexander, Orange, N. J., and assistant secretary, A. L. Jackson, Phar.D., Philadelphia.

Tuberculosis Conferences.—Conferences on antituberculosis, under the auspices of the National Association for the Study and Prevention of Tuberculosis, will be held in October and November, as follows:

North Atlantic Tuberculosis Conference at Baltimore, October 17 and 18.

New England Conference in Rutland, Vt., October 4 and 5.

Mississippi Valley Conference in Minneapolis and St. Paul, October 8, 9 and 10.

Northwestern Conference in Portland, Ore., October 15 and 16.

Southwestern Conference in Grand Canyon, Ariz., October 22 and 23.

Southern Conference in Chattanooga, Tenn., November 9 and 10.

The war problems of tuberculosis will be the dominant subject of discussion at all these conferences.

FOREIGN

International Child Welfare Congress.—The second International Child-Welfare Congress will be held in Montevideo in 1918. The first congress was held in Buenos Aires in July, 1916. The president of Uruguay, through the *Diario Oficial* of Aug. 10, 1917, issued a decree providing for the holding of the congress, March 17 to 24, 1918, under the auspices and protection of the government. A monthly sum of 100 pesos gold will be paid by the Uruguayan government to the executive committee appointed by the first congress. Invitations will be sent to all other American countries to participate by sending delegates to the congress.

Society for Research on Medical Biology.—The Swiss Société helvétique des Sciences naturelles was the original model on which Virchow founded the German organization which meets once a year for what are popularly called the *Naturforscher* congresses. The venerable Swiss association now announces the formation of a section or subsociety devoted to medical biology, to be known as the Société de Médecine et de Biologie. Professor Hedinger of the University of Basel is the moving spirit in the matter. The inaugural meeting is to be held this month at Zurich. It is hoped for a large membership among physicians interested in medical biologic questions.

CANADA

Personal.—Capt. Roland W. Young, Oshawa, Ont., recently returned from two years' service with the R. A. M. C. in Malta and Egypt, has been appointed on the staff of the Whitby Military Hospital, Whitby, Ont.——Sir James A. Grant, M.D., Ottawa, Ont., was recently tendered a reception at Detroit by a number of prominent citizens.

Medical Writers Censored.—Articles on medical and surgical subjects connected with the war having been appearing from time to time in various Canadian and other medical periodicals, attention has been called to this by special orders issued by the British Expeditionary Forces, of which the Canadian Expeditionary Forces form a part, and hereafter physicians and surgeons are forbidden to contribute such articles without securing the consent in advance of publication of the Director-General of Medical Services, to whom all articles on such subjects must be submitted.

Canadian Public Health Association Meeting.—The annual meeting of the Canadian Public Health Association was held in Ottawa, September 27 and 28. Dr. Joseph D. Page, Quebec, in his presidential address, dealt principally with the immigration problems of Canada as compared with those of the United States, considering that the holding of steamship companies, by the latter, responsible for the class of immigrants brought to the country, was much in advance of Canadian methods. In advocating a ministry of public health, he thought Canada would not get that until there was a strong public sentiment behind it. There was need for getting ready now in preparation for coming immigrants after the war. Capt. Gordon A. Bates, Toronto, C. A. M. C., read a paper on venereal diseases, contrasting the efficiency with which those diseases were dealt with in the army, and the comparative indifference of the civic authorities. He gave statistics of 417 cases recently analyzed, which showed seventy infected men under 20 years of age and 144 between 21 and 25 years. About 260 were single men and thirty-six were married, the balance being (likely) widowers. In 295 cases the influence of alcohol was denied. Forty-four were classed as professionals, while in 127 cases no money was paid. Sixty cases of infection took place in the boarding houses of the females; 119 cases out of doors in parks, etc. Dr. Bates considered that immediate steps should be taken to facilitate early diagnosis and prompt treatment. Venereal diseases should be made quarantinable immediately, and a law passed in Canada to that effect. Major Maxwell Lauterman, Montreal, stoutly advocated a Minister of Public Health for Canada, as venereal diseases were the greatest menace of the civilized world today, bar none. Mr. Miles M. Dawson, an actuary of New York, and Mr. I. M. Rubinow, New York, dealt with the question of health insurance. They strongly advocated noncommercial insurance. Dr. Charles J. C. O. Hastings, M. O. O. H., Toronto, took up the question of "patent medi-

cines" and alcoholic mixtures. He said there are too many "cures" on the market containing an excess of drugs and alcohol, the latter particularly since prohibition had gone into effect. The consumption and cancer "cures" are robbing the victims of those diseases of the only chance they had of being cured. Manufacturers of such concoctions are criminals of the worst type and highest degree. There is no worse menace to the public than the makers of such alleged cures. Dr. Hastings advocated health insurance on the same plan as in England, and he believed the government would soon have to take action. Dr. Alan G. Brown, Toronto, deplored the fact that Canadian mothers do not do their duty in respect to maternal nursing. He quoted statistics to prove that American women and even foreign women were 50 per cent. ahead of the women of Canada in this respect. Canada, he averred, stands alone for total inactivity on the part of the state in regard to child welfare.

PARIS LETTER

PARIS, Sept. 2, 1917.

The War

PENETRATING WOUNDS OF THE KNEE-JOINT

Dr. Mauclaire, agrégé professor and hospital surgeon at the Faculté de médecine at Paris, has submitted a report to the Société de chirurgie of Paris on a communication sent to the society by Dr. Stern in October, 1916, which dealt with articular wounds of the knee treated before Loubat and Moiraud had extolled the merits, in such cases, of immediate mechanical disinfection followed by primary suturing, a method which Stern has likewise since applied with satisfaction.

From the study of seventy-one cases taken from his former practice, Stern draws the following conclusions as regards indications for operation:

He has encountered several cases of simple intra-articular setons, caused by a rifle bullet, with punctiform orifices at the point of entrance and exit, and without bony lesions. Compression and immobilization sufficed to cure these patients, if carefully attended to, and extensive articular movement was preserved. It goes without saying, furthermore, that, if there is an intra-articular projectile, and there is the slightest sign of articular reaction, it is necessary to intervene in these wounds with punctiform seton. Exploratory arthrotomy is indicated immediately after the wound is received, in order to remove the isolated splinters, or to extract an intra-articular projectile, the presence of which roentgenography has revealed. The U-shaped subpatellar incision should be performed, unless the lesions are diffuse. The parapatellar incision is often sufficient and is not so destructive of tissue as the subpatellar. Arthrotomy and evacuation are indicated at the onset of infectious arthritis with extravasation, and this may suffice, provided immediately afterward the symptoms of articular septicemia are seen to disappear. Typical primary articular resection should be resorted to if there are extensive bony lesions. Secondary resection will be done if the suppurative arthritis becomes complicated by grave septicemic symptoms. Stern favors general anesthesia by means of ethyl chlorid, since it causes only a slight shock to the patient. He strongly disinfects the articulation with ether. He makes as few changes of dressings as possible. He uses a plaster apparatus which consists of two distinct segments (one including the thigh and one including the lower leg), joined together by encircling bands and fitting one within the other, which makes it possible, after the twelfth day, to commence to draw the bony surfaces together, after the manner recommended by Chaput and Alquier. The posture of the foot should be carefully watched, as there is a tendency toward talipes equinus. Amputation of the thigh is, of course, imperative when the infection is very threatening or when the bony lesions are multiple and extensive.

In combating septicemic symptoms Stern uses injections of a 47 per cent. glucose solution, injections of colloidal gold, theobromin (which promotes diuresis), laxatives and perspiration induced by a system of electric bulbs placed under the bedcovers.

The immediate results were eight deaths out of seventy-one cases, or 11.2 per cent. (five deaths, or 15 per cent., out of thirty-three infected cases; three deaths, or 8 per cent., out of thirty-eight noninfected cases). Complete arthrotomies caused four deaths out of thirty-four cases (12 per cent.). Seven unilateral arthrotomies, four total rotulectomies, three partial rotulectomies, and seven typical total resections of the knee-joint did not occasion a single death. Three partial resections (condyle) caused one death. Ten amputations of the thigh resulted in three deaths (30 per cent.), and three cases in which the surgeon refrained from operating resulted in recovery.

The more remote results may be thus described: Of the twenty-seven arthrotomies that could be followed up to the time of their cicatrization and beyond, there were seven cases of total ankylosis, nine cases of partial ankylosis, eight cases in which the flexure equaled or exceeded 90 per cent. of the normal, and three cases of perfectly normal flexure. It is only proper to state, however, that a number of the patients who came under the second and third categories could be still benefited by mechanotherapy, and this treatment continued to be applied. Of the seven partial or total rotulectomies, cicatrization took place in three cases, in one of which almost complete mobility was secured, and in the other two cases there was almost complete ankylosis. Of the seven cases of typical resection of the knee-joint, it was possible to learn the later history in four instances. The age of the patients varied from 19 to 30 years. Of these four cases there were two cases of complete consolidation after three and a half months, one case of incomplete consolidation after 145 days, and one case of incomplete consolidation after ninety days.

A CENTER FOR VOCATIONAL REEDUCATION ESTABLISHED

Under the auspices of Fernand David, minister of agriculture, Justin Godart, undersecretary of state for the military medical service, and Medical Inspector Polin, director of the medical service of the military government of Paris, a center of vocational reeducation for the war wounded (both the wounded under treatment and the wounded who have been discharged from active service) has been created at the national school of agriculture at Grignon, in Seine-et-Oise.

The instruction at Grignon will comprise practical courses looking toward the reeducation of mind, nerve and muscle, such as courses in gardening, agricultural work, and all the trades that serve the needs of the agriculturist: saddle making, harness making, basket work, carpentry, iron and metal work, horseshoeing, masonry, cooperage, etc. The new institution can accommodate 500 students. For those who are discharged from active service but who cannot continue their antebellum vocation, courses of general instruction, in accountancy, stenography, typewriting, mechanical drawing, prosthetic dentistry, tailoring, hairdressing, domestic science and the manufacture of playthings, all of which are presided over by experts, have been established.

Potatoes in Relation to Bread Production

M. Maurice Viollette, food administrator, sent out recently a circular letter of inquiry addressed to the prefects of the various departments, asking them to express an opinion on the result of the experiments to be conducted with regard to the mixture of potatoes and flour in the preparation of bread. He received a large number of replies testifying to the fact that the experiments gave complete satisfaction. The report that the prefect of the department of Eure-et-Loir received on this subject from M. Carola, director of the agronomic station at Chartres, states that bread made with the addition of boiled potatoes in the proportion of 20 per cent. has been found equally as good, if not better, than the bread now in use. It has also been observed that it keeps fresh longer. A round loaf cut ten days after it was baked was still fit for consumption. On analysis this bread has been found to present the following composition:

Water	34.70
Ash	1.18
Nitrogenous material	6.90
Starch	56.50
Cellulose	0.72
Total	100.

This bread is capable of furnishing the human system with 253.6 calories per hundred grams of the material; that is to say, a figure equal to that of the bread now in use (white, rye and barley). In case of need, the potato would, then, constitute no mean resource in view of its power to improve the quality of bread. M. Viollette regards these experiments as conclusive, and has instructed the prefects, from now on, whenever there is a serious shortage in the grain crop, to take the necessary action to avoid waste of the potato supply. The potato is thus given an added importance, since it is possible to utilize it in the preparation of bread.

Marriages

MAJOR NORMAN THOMAS KIRK, M. C., U. S. Army, Fort Oglethorpe, Ga., to Miss Anna M. Duryea of New York City, at Fort Oglethorpe, Ga., September 21.

CAPT. HARRY MUNN GODFREY, R. A. M. C., Charlottetown, P. E. I., to Miss Margaret W. Hawley of Brookline, Mass., in Boston, September 18.

FRANCIS DUDLEY BUCK, M.D., New York City, to Miss Clara B. Moody of East Northfield, Mass., in Brooklyn, September 18.

MARC RAY HUGHES, M.D., St. Louis, to Mrs. Rosalie N. Livingston of Lake Crystal, Minn., at Edwardsville, Ill., September 20.

FRANCIS MARION POTTENGER, M.D., Monrovia, Calif., to Miss Caroline Margaret Lacy of Pasadena, Calif., September 14.

LIEUT. WILLIAM WASHINGTON VAUGHAN, M. C., U. S. Army, Manila, P. I., to Miss Mela K. Fairchild, at Manila, July 13.

FRANCIS BONNEAU JOHNSON, M.D., Charleston, S. C., to Mrs. Ritchie McGann of Washington, D. C., September 11.

PHILIP EDWARD STANGL, M.D., Paynesville, Minn., to Miss Josephine Friberg of St. Paul, in Chicago, September 13.

P. A. SURG. HARRY LEE BROWN, U. S. Navy, to Miss Hazel Robinson of Lewiston, N. Y., September 1.

EERKO SAMUEL AEILTS, M.D., Forreston, Ill., to Miss Grace Engle of McKee, Ky., August 18.

A. LOVETT DEWES, M.D., to Miss Margaret Dakin, both of Haverford, Pa., September 15.

Deaths

William Conner Shaw, M.D., Pittsburgh; Bellevue Hospital Medical College, 1872; aged 71; formerly a Fellow of the American Medical Association; a member of the Medical Society of the State of Pennsylvania, and the American Academy of Medicine; attending physician to Bethesda Hospital since 1889; physician to the Pittsburgh Free Dispensary from 1876 to 1882; for ten years surgeon to Mercy Hospital; died at the Allegheny General Hospital, September 18.

Lieut. Matthias Miller Wagner, M. R. C., U. S. Army, Albion View, Signal Mountain, Tenn.; University of Tennessee, Nashville, 1898; aged 41; a Fellow of the American Medical Association; on duty at Fort Story, Cape Henry, Va.; was drowned while swimming at Cape Henry, September 18.

Morey Charles Collier, M.D., Painted Post, N. Y.; Albany (N. Y.) Medical College, 1906; aged 38; a Fellow of the American Medical Association; formerly health officer of Corning, and visiting physician to the Corning Hospital; died at his home, September 16, from cerebral thrombosis.

Samuel B. Growdon, M.D., Cherokee, Okla.; Kentucky University, Louisville, 1902; aged 56; formerly a Fellow of the American Medical Association; a member of the Oklahoma State Medical Association, and president of the Alfalfa County Medical Society; died at his home, August 9.

Thomas Jefferson Lee, M.D., Rocky, Okla.; Vanderbilt University, Nashville, Tenn., 1883; aged 56; formerly a Fellow of the American Medical Association; a member of the Oklahoma State Medical Association, and a member of the council; died at his home, August 6.

John Earhart Morris, M.D., Indianapolis; Medical College of Indiana, Indianapolis, 1896; aged 48; formerly a Fellow of the American Medical Association; associate professor of surgery in the Indiana School of Medicine, Indianapolis; died at his home, August 25.

John A. Staral, M.D., Cleveland; Western Reserve University, Cleveland, 1904; aged 36; a Fellow of the American Medical Association; assistant in the tuberculosis dispensary in his alma mater; died in the Lakeside Hospital, Cleveland, September 17.

Alfred De Carre, M.D., Washington, D. C., George Washington University, Washington, D. C., 1889; aged 67; a veteran of the Franco-Prussian War; for many years an employee of the Treasury Department; died at his home, September 16.

Charles Gennerich, M.D., New York City; New York Homeopathic Medical College, New York City, 1896; aged 42; formerly professor of orthopedic surgery in the New York Medical College and Hospital for Women; died at his home, September 14.

Charles J. Ocasek, M.D., Chicago; Rush Medical College, 1893; aged 47; a well known Bohemian physician; while crossing the street, September 27, was struck by a streetcar and died in the ambulance while being taken to the hospital.

Harriet Scudder Mason, M.D., West Brighton, N. Y.; Eclectic Medical College of the City of New York, 1899; for sixteen years house physician of the Little Mother's Aid Association of New York; died at her home, September 17.

William Augustus Muhlenberg Schnecker, M.D., New York; Columbia University, College of Physicians and Surgeons, New York, 1899; aged 40; a member of the Medical Society of the State of New York; died at his home, September 13.

Charles Franklin Wackenhuth, M.D., Picture Rocks, Pa.; Western Pennsylvania Medical College, 1892; aged 56; a member of the Medical Society of the State of Pennsylvania; died in the Williamsport Private Hospital, September 13.

Edson Card, M.D., White Plains, N. Y.; Columbia University, College of Physicians and Surgeons, New York, 1882; aged 61; a member of the Medical Society of the State of New York; died at his home, September 9, from apoplexy.

Prementer Mullinix, Greencastle, Ind. (license, Indiana, 1897); aged 82; formerly a member of the Indiana State Medical Association; for many years a druggist; died at the home of his daughter, in Sioux City, Iowa, September 16.

Lacy Kindred Bobo, M.D., Maquoketa, Iowa; University of Louisville, Ky., 1889; aged 56; formerly a member of the Iowa State Medical Society; died at the home of his sister in Dallas, Texas, September 20, from cerebral hemorrhage.

John Milton Grosvenor, M.D., Middleton, Mass.; Dartmouth Medical School, Hanover, N. H., 1864; aged 78; assistant surgeon of volunteers during the Civil War; a manufacturing chemist; died at his home, September 21.

Howard W. Bassett, M.D., Richmond, Va.; Chicago Homeopathic Medical College, 1889; Medical College of Virginia, Richmond, 1906; aged 55; died in the Tucker Sanatorium, Richmond, July 15, from cerebral hemorrhage.

Thomas G. Boorman, M.D., Celina, Texas; Memphis Hospital Medical College, Memphis, Tenn., 1900; aged 53; a member of the Texas State Medical Association; died at a sanatorium in Terrell, Texas, September 12.

Lieut. Benjamin W. J. Worrall, U. S. Navy, Kansas City, Mo.; University of Kansas, Lawrence and Rosedale, 1906; aged 38; was instantly killed in an automobile accident at North Tonawanda, N. Y., September 15.

J. H. Williford, M.D., Dawson, Ga.; Cincinnati College of Medicine and Surgery, 1874; aged 65; formerly a member of the Medical Association of Georgia; died suddenly from heart disease at his home, September 11.

William Francis Brady, M.D., Scranton, Pa.; Jefferson Medical College, 1884; aged 53; formerly a member of the Medical Society of the State of Pennsylvania; died at his home, September 18, from angina pectoris.

Frederick Whittlesey Peck, M.D., New Britain, Conn.; Cleveland University of Medicine and Surgery, 1897; aged 50; died in the New Britain General Hospital, September 10, after an operation on the intestines.

Samuel G. Wishard, M.D., Watonga, Okla.; Western Reserve University, Cleveland, 1874; aged 74; formerly a member of the Oklahoma State Medical Association; a veteran of the Civil War; died early in August.

I. O. Kemberling, M.D., Colon, Mich.; Homeopathic Hospital College, Cleveland, 1873; aged 76; a veteran of the Civil War; for twenty-eight years a practitioner of Detroit; died at his home, about September 14.

Myron Dwight Gray, M.D., Cambridge Springs, Pa.; University of Pennsylvania, Philadelphia, 1874; aged 65; formerly a member of the Medical Society of the State of Pennsylvania; died recently at his home.

Benjamin Maltby Page, M.D., Pasadena and Redondo Beach, Calif.; College of Physicians and Surgeons in the City of New York, 1864; aged 74; died in his summer home, at Redondo Beach, September 16.

William Izard Bull, M.D., Charleston, S. C.; Medical College of the State of South Carolina, Charleston, 1860; aged 79; a surgeon in the Confederate Army during the Civil War; died at his home, July 29.

Pramath Nath Roy, M.D., Boston; University of Glasgow, Glasgow, Scotland, 1885; aged 58; for many years surgeon of the Allan Steamship Line; died at his home, September 5, from heart disease.

Augustine B. Libby, M.D., Smyrna Mills, Me.; Baltimore University School of Medicine, Baltimore, 1894; aged 60; a member of the Maine Medical Association; died at his home, about September 7.

Joseph Charles Myers, M.D., Clinton, Ill.; Miami Medical College, Cincinnati, 1880; aged 59; a Fellow of the American Medical Association; died at his home, September 19, from heart disease.

John J. Weitzman, M.D., Detroit; Michigan College of Medicine and Surgery, Detroit, 1901; aged 38; died in Harper Hospital, September 16, after an operation for appendicitis.

Albert L. Bingham, M.D., Williston, Vt.; University of Vermont, Burlington, 1875; aged 64; a member of the Vermont State Medical Society; died at his home, August 7, from diabetes.

Abner Toothaker Wells, M.D., Kendallville, Ind.; Baltimore University, 1899; aged 42; a member of the Massachusetts Medical Society; died, August 17, in Little Rock, Ark.

Frederick Bernard Baurichter, M.D., Cincinnati; Cincinnati College of Medicine and Surgery, Cincinnati, 1898; aged 41; died in Christ Hospital, September 3, following an operation.

Charles Oliver Sahler, M.D., Kingston, N. Y.; College of Physicians and Surgeons in the City of New York, 1878; aged 63; died in his sanatorium in Kingston, September 17.

Michael O'Farrell, M.D., Shawnee, Ohio; Bellevue Hospital Medical College, 1876; aged 66; for forty-one years a practitioner of Shawnee; died at his home, September 14.

Carlos de Campos, Jr., M.D., Paulista, Brazil; Hahnemann Medical College, Philadelphia, 1917; aged 21; died, September 11, in the Hahnemann Hospital, from pneumonia.

George W. Ling, M.D., Dutton, Ont.; University of Michigan, Ann Arbor, 1864; University of Victoria College, Coburg, Ont., 1866; died at his home, about September 18.

Thomas Henry Hannan, M.D., Hoosick Falls, N. Y., Bellevue Hospital Medical College, New York, 1891; aged 50; died at his home, July 27, from insolation.

Charles E. Triplet, M.D., Morocco, Ind.; Kentucky School of Medicine, Louisville, 1856; aged 82; a veteran of the Civil War; died at his home, August 28.

Benjamin Sturgis Van Zile, M.D., New York; Bellevue Hospital Medical College, 1875; aged 72; died at his home, September 3, from senile debility.

James Lang, M.D., Pasadena, Calif.; Bellevue Hospital Medical College, New York, 1879; aged 86; died at his home, September 7, from senile debility.

Benjamin Franklin Stark, M.D., Lyerly, Ga.; Chattanooga Medical College, Chattanooga, Tenn., 1909; aged 31; died at his home, June 30, from enteritis.

Abner Osborn Van Horn, M.D., Middle Island, N. Y.; Bellevue Hospital Medical College, New York, 1873; aged 72; died at his home, September 5.

Horace Lee Metts, M.D., Willie, Ga.; Atlanta School of Medicine, Atlanta, Ga., 1912; aged 35; committed suicide at Hinesville, Ga., September 4.

William Minns Caldwell, M.D., New Castle Bridge, N. B.; Harvard University, Boston, 1867; aged 72; died, July 3, at St. John, N. B.

Thomas Edwin Kelly, M.D., Brooklyn; Long Island College Hospital, Brooklyn, 1900; aged 39; died at his home, September 13.

William P. Bouton, M.D., Lebanon, Tenn.; University of Louisville, Louisville, Ky., 1870; aged 69; died at his home, September 3.

Harry Albert Salmon, M.D., New York; Bellevue Hospital Medical College, New York, 1888; aged 59; died at his home, September 10.

Joseph Evans, Jenelew, W. Va. (license, West Virginia, years of practice, 1881); aged 82; died, about September 1.

J. F. Snyder, Hazleton, N. D. (license, North Dakota, 1899); aged 53; died at his home, August 31, from heart disease.

Thomas C. Brady, Marshalltown, Iowa (license, Iowa, 1887); aged 45; died at his home, September 1.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

ZIRATOL

Report of the Council on Pharmacy and Chemistry

Ziratol (Bristol-Myers Company, New York), in compliance with the federal "insecticide law," is declared to contain 32 per cent. water and 30 per cent. glycerin as inert constituents. Regarding its active constituents the manufacturer makes the following and meaningless statement:

"Ziratol is prepared from Phenols of the Naphthalene series and consists of a solution of such Phenols in a mixture of soap, water and glycerin."

In response to inquiry, the A. M. A. Chemical Laboratory examined Ziratol and reported that its essential constituent appears to be alpha-napthol,[1] and that it has, essentially, the following composition by weight: Alpha-napthol 18 per cent., soap 20 per cent., glycerin and water sufficient to make 100 per cent.

A Ziratol advertising circular gives a tabulated report of germicidal tests, said to have been made according to the method of the Hygienic Laboratory of the U. S. Public Health Service. When this work was done is not stated. According to these tests Ziratol possesses a phenol-coefficient of 13.66. The claim that Ziratol is ten times more efficient than carbolic acid (phenol) is evidently based on this report.

These claims of high germicidal value are contradicted by an examination made for the Council. A specimen purchased in the open market was examined independently by two operators, to determine the Hygienic Laboratory phenol-coefficient. One observer found the phenol coefficient to be 2.54. The other reported it to be 3.09. Evidently the germicidal value of Ziratol is greatly exaggerated in the advertising claims and, in fact, does not exceed that of the official compound solution of cresol (Liquor Cresolis Compositus, U. S. P.) for which a phenol-coefficient of about three has been established. (See New and Nonofficial Remedies, 1917, p. 82.) The claim that Ziratol is "the Universal Antiseptic and Germicide" is manifestly an unwarranted exaggeration.

The referee in submitting this report to the Council recommended that Ziratol be held in conflict with Rule 1 (secrecy of composition) and Rule 6 (unwarranted and exaggerated claims). After the report had been submitted, it was found that a new advertising circular, accompanying a trade package, no longer contained the claim that "Ziratol is ten times more efficient than Carbolic Acid." The older circular made the following statement:

"1. Strong Activity.—Compared with the bactericidal action of Carbolic Acid by the method of the Hygienic Laboratory of the Marine Hospital Service, ZIRATOL has the Carbolic Acid Coefficient of more than TEN, that is, ZIRATOL is TEN times more efficient than Carbolic Acid,—a strength unapproached by any other of its class. ZIRATOL in dilution of 1:1400 kills the Typhoid Bacillus in 2½ minutes, thus proving that it is strongly active even in very weak solutions."

The new advertising circular reads:

"1. Strong Activity—Extensive bacteriological investigations on many pathogenic organisms, conducted in the Lederle Laboratories of New York, prove conclusively the high bactericidal value of Ziratol in extremely dilute solutions. (A copy of the complete report will be mailed upon request.)"

In response to a request, the Bristol-Myers Company sent a copy of the bacteriologic investigations of Ziratol, said to have been made by the Lederle Laboratories. The organisms employed for these tests were *Staphylococcus aureus, Staphylococcus albus, Streptococcus,* Green pus bacillus, *B. coli,* and saliva. No tests are given with the typhoid bacillus. The

1. Alpha-napthol was also found to be the basis of the nostrum Benetol. See THE JOURNAL, April 15, 1911, p. 1128.

conclusion is reached that "in all the tests the solutions of Ziratol have several times greater killing efficiency than those of phenol." The "coefficients" or comparative values which can be calculated from the results after exposure of 15 minutes to the disinfectants range from 2.0 to 4.0. This is in substantial accord with the referee's findings as regards the phenol-coefficient with *B. typhosus* as the test object. While the new advertising circular avoids the former claim that Ziratol is ten times more efficient than carbolic acid, in germicidal value, it still makes the unwarranted claims that Ziratol is the "universal disinfectant."

The Council declared Ziratol inadmissible to New and Nonofficial Remedies (1) because its composition is secret (Rule 1); (2) because the phenol coefficient, determined according to the method of the Hygienic Laboratory, U. S. P. H. S., is not stated on the label (Rule 2); (3) because the label and the circular accompanying the trade package advises its use by the public as a "vaginal douche" (Rule 3); and (4) because the claim that Ziratol is the "universal disinfectant" is exaggerated and unwarranted (Rule 6).

Before authorizing publication of the preceding report the Council submitted it to the Bristol-Myers Company in order to give that company the opportunity of revising its method of marketing Ziratol. In reply the company enlarged on its withdrawal (on "our own initiative") of the claim that Ziratol had a phenol-coefficient of over ten when this claim was shown to be incorrect "by authoritative sources." One wonders whether this is a euphemistic reference to the proceedings of the federal authorities under the Insecticide Act against the Bristol-Myers Company, just made public,[1] because of the false claims made for the germicidal efficiency of Ziratol. This prosecution resulted in the seizure and condemnation of two lots of this proprietary which had passed in interstate commerce.

The Bristol-Myers Company in replying to the Council's report made no offer to declare the exact composition of Ziratol, to state the actual phenol-coefficient, or to remove the other objections pointed out in the report of the Council. In other words, the Bristol-Myers Company has abandoned a definite, but false claim of high germicidal power—a claim which subjected the firm to federal prosecution—and has substituted therefor indefinite statements which do not define the actual germicidal efficiency of Ziratol.

SOME MISBRANDED NOSTRUMS*

DeWitt's Eclectic Cure.—W. J. Parker & Co., Baltimore, Md., was the proprietor of "Dr. De Witt's Eclectic Cure," which contained alcohol, opium and ether. It was sold under the claim that it was an internal and external remedy for cholera, dyspepsia, diphtheria, croup, scarlet fever and other conditions. These claims were declared false and fraudulent. It was declared further misbranded in that while the label declared the presence of 75 per cent. alcohol and 1 grain of opium to the fluid ounce, the stuff actually contained 60 per cent. alcohol and 1.3 grains of opium to the ounce. W. J. Parker & Co. admitted the allegations of the libel. The court ordered that if the company would pay the cost of the proceedings and give a bond not to sell the stuff under claims that would bring it into conflict with the Food and Drugs Act, the 288 bottles of "DeWitt's Eclectic Cure" that had been seized might be delivered to it.—[*Notice of Judgment No. 4470.*]

DeWitt's Liver, Blood and Kidney Cure.—William J. Parker, who traded under the name the W. J. Parker Co., Baltimore, Md., sold "Dr. DeWitt's Liver, Blood and Kidney Cure" under the claim that it would cure diabetes, Bright's disease, malaria and diseases of the liver, blood and kidneys. Government chemists reported that the preparation, which contained over 11 per cent. alcohol, was essentially an alcohol-water solution bearing a cathartic drug together with Epsom salt, nitrates and iodids. The taste suggested senna. The claims made by Parker were declared recklessly and wantonly false and fraudulent. He pleaded guilty and was fined $15.—[*Notice of Judgment No. 4440.*]

Lightning Hot Drops.—This nostrum was sold by the Herb Medicine Co., Springfield, Ohio, and admittedly contained 60 per cent. alcohol and 48 drops of chloroform to the ounce. The federal chemists reported also the presence of ether and cayenne pepper. It was sold as a cure for diphtheria, bloody flux, inflammatory rheumatism, *la grippe* and all aches and pains. These claims were declared false and fraudulent and applied knowingly. The company pleaded guilty and was fined $50 and costs.—[*Notice of Judgment No. 4414.*]

Mother's Salve Mother's Remedy.—The Mother's Remedies Co. of Chicago, Ill., manufactured this preparation, which, according to the government chemists, was a green-colored salve consisting of petrolatum (vaseline) with some glycerin, potassium chlorate and oils of cloves, cinnamon, eucalyptus, sassafras and pine or juniper, together with a gum, like gum acacia, and a small amount of fatty oil. The label declared that the product was "Prepared from vegetable oils," a false and misleading statement, as, actually, it was prepared from animal, mineral and vegetable oils. It was further sold under the claim that it was a preventive of diphtheria and pneumonia, a "cure" for croup and catarrh and a remedy for eczema, piles and salt rheum. These claims were declared recklessly and wantonly false and fraudulent. The company pleaded guilty and was fined $25 and costs.—[*Notice of Judgment No. 4427.*]

Raney's Blood Remedy.—This preparation was manufactured by Leila J. Raney of Atlanta, Ga., who did business under the name of Raney Medicine Co. The government chemists reported that analysis showed the product to be a solution of potassium iodid ("potash") and corrosive sublimate in syrup of sarsaparilla with 16 per cent. alcohol. It was sold under the claim that it was a "cure" for cancer, pellagra, catarrh, female complaints and rheumatism and as a remedy for carbuncles, eczema, diseases of the kidneys, all blood and nerve diseases and was, in addition, a nerve tonic and a nerve rebuilder. These claims were declared false and fraudulent and applied knowingly, recklessly and wantonly. Leila J. Raney pleaded guilty and was fined $50.—[*Notice of Judgment No. 4436.*]

Rattlesnake Oil Liniment.—The federal authorities seized 51 bottles of "White Eagle Indian Rattlesnake Oil Liniment" charging that the product was misbranded under the Food and Drugs Act. The name was declared misleading in that it purported to state that the product contained rattlesnake oil, whereas, in fact it contained no appreciable amount, if any, of such oil. The claims on the trade package that the stuff was a positive cure for rheumatism, catarrh, diphtheria, eczema and various other conditions were declared false and fraudulent. No claimant having appeared, the court entered judgment of condemnation and forfeiture and ordered that the United States marshal should destroy the product.—[*Notice of Judgment No. 4442.*]

Rosadalis.—Hall & Ruckel, New York City, sold this preparation which, according to government chemists, was essentially a water-alcohol solution containing over 32 per cent. alcohol and 2.8 grams per 100 c.c. of potassium iodid and a cathartic drug. It was sold under the claims that it would cure all malarial impurities of the blood, consumption in its early stages, rheumatism, "female diseases," chronic diseases of the blood, liver, kidneys and bladder. These claims were declared false and fraudulent and made recklessly and knowingly. The company pleaded guilty and was fined $25.—[*Notice of Judgment No. 4505.*]

1. U. S. Dept. of Agric., Insecticide and Fungicide Board, Service and Regulatory Announcements, No. 16, issued Aug. 8, 1917. *No. 244*, Misbranding of "Ziratol." U. S. *v.* 100 bottles, more or less, of "Ziratol"; consent decree of condemnation and forfeiture; product ordered released on bond, p. 248. *No. 256*, Misbranding of "Ziratol." U. S. *v.* 936 bottles and 6 jugs of Ziratol, consent decree of condemnation and forfeiture; product ordered released on bond, p. 260.

* This material, with much additional, appears in the new edition of the pamphlet "Convictions," price fifteen cents.

Correspondence

DRAFTING THE MEDICAL PROFESSION

To the Editor:—An editorial appeared in THE JOURNAL, Aug. 11, 1917, p. 474, concerning the selective draft of physicians. The New York State Committee of National Defense, Medical Section, after a most careful and exhaustive study, came to the conclusion that a classification of physicians in the United States should be made with selection of those whose age, physical condition, freedom from family obligation, etc., would make them available and desirable for Army service, such classification to exclude all those whose services were necessary in rural districts, hospitals, health departments and medical colleges, and that authority should be secured to furnish the former to the Army and to keep the latter at home.

The first step in this plan was to send a petition to the Council of National Defense explaining the need and advantages of a selective draft. This petition was printed in THE JOURNAL, August 25, and is now being circulated among the physicians in New York state.

Your editorial comment made this proposal appear as an effort to discredit the patriotism of the medical profession. No such thought actuated the framers of the petition. The idea was first formally proposed by the Medical Section of the North Carolina State Committee and has been approved by many prominent members of our profession.

The following statement regarding the selective draft of physicians was prepared by the secretary, Dr. F. T. Van Beuren, Jr., and gives a very clear explanation of the aims and purport of this plan.

1. The principle of Universal Service requires that every individual should serve the Nation in time of need, in that situation which best befits his age, his experience, his talents and education and his economic status.

2. It is founded on the obligation universally owed by every individual to the Nation whose protection and opportunities he has enjoyed.

3. The New York State Committee of National Defense, Medical Section, believes in and affirms this obligation and the principle of Universal Service founded upon it.

4. In war time the medical profession is faced by the duty of
   (*a*) Furnishing to the Army an adequate number of physicians fit to become medical officers.
   (*b*) Furnishing adequate medical care to civil communities at home.

5. It is obvious that, in an emergency like the present, when a large percentage of the physicians of this country are needed as medical officers for our own Army and to aid the armies of our Allies (whose available supply of new medical personnel is practically exhausted—see "London Letter" in JOURNAL A. M. A., September 8th, 1917), an orderly and efficient plan of procedure is desirable and will sooner or later become necessary. It is obvious, also, that not all physicians are fit to become medical officers.

6. To be effective then, in fulfilling the duties stated in paragraph 1, such a plan must include two essentials:
   (*a*) An adequate classification upon which to base the selection of those who are fittest for the Army and those who are most needed at home.
   (*b*) Authority to furnish the former individuals to the Army and to retain the latter at home.

7. The most efficient plan so far offered for accomplishing these essentials is the one recommended by the New York State Committee of National Defense, Medical Sections, in its Petition for Selective Draft of Physicians. It provides for:
   (*a*) A Federal classification of physicians by a special Federal Medical Census similar to the recent special Medical Census of New York State.
   (*b*) Authorizing the President to call into service and commission as medical officers an adequate number of physicians between the ages of 21 and 45 years fit for army service.

8. The selection of these individuals would be made by lot from all those determined by the classification to be available and desirable for army medical service. The selection would be in the hands of the medical profession and the quota to be furnished by each County in the United States would be based upon the number of such available physicians in that County.

The necessary authority would be delegated, in the form of Regulations, to the Surgeon General of the Army and to the County Auxiliary Medical Committee for National Defense. The Judge Advocate General has stated that the legal requirement of such a plan would be constitutional.

It is confidently hoped that when this proposal is thoroughly understood it will receive the cordial support of every red blooded physician who desires to render the most effective, intelligent and patriotic service to his country in this great emergency.

HENRY L. K. SHAW.
Major, M. R. C., U. S. Army, Madison Barracks, N. Y.

PRIORITY IN APPLICATION OF HEAT IN CORNEAL ULCER

To the Editor:—I take great pleasure in correcting an error which was made by myself in discussing the papers of Drs. Verhoeff and Shahan at the recent meeting of the Section on Ophthalmology of the American Medical Association in New York.

I participated in this discussion on the spur of the moment, after listening, with careful attention, to the various ophthalmic surgeons. It was a surprise that the authors of these papers did not mention the father of this treatment, one of San Francisco's pioneers in ophthalmology. When I began my remarks on the subject I could not recall the name of Dr. Martinache, and appealed to the audience. Dr. Park Lewis of Buffalo mentioned the name of Dr. Barkan, whom I accepted for the moment, thinking that on my return home I would look up the reference and give credit to the proper person, Dr. Martinache. Since reading Dr. Nagel's letter to THE JOURNAL, Sept. 15, 1917, p. 933, I have looked up the data on the subject and can confirm Dr. Nagel's statement, giving credit to Dr. Martinache, whom I had in mind all the time, but whose name I could not recall at the time. "Honor to whom honor is due."

L. WEBSTER FOX, M.D., Philadelphia.

A SELECTIVE DRAFT OF PHYSICIANS BASED ON CLASSIFICATION

To the Editor:—After reading the communication of Major Derby on this subject (THE JOURNAL, Sept. 22, 1917, p. 1023), I cannot refrain from writing a few words.

Major Derby is most inconsistent in saying the Army wants the best men of the profession and the younger men. We all know that the youngest men are not the best men of the medical profession. They have not had time to become the best men. And it certainly is cruel and unjust to speak of men who have given up everything—homes, families, profession and incomes ranging from five to twenty times what the government is paying them—as failures and an inferior lot. Certainly, judging from the men who have gone from this part of the country, Major Derby is a very poor judge of the profession and of men.

MRS. C. J. COMBS, Oshkosh, Wis.

To the Editor:—In THE JOURNAL, Sept. 22, 1917, I see a criticism of the Medical Reserve Corps from Richard Derby, Major, M. R. C. At Fort Riley, Kan., we have specialists in all lines of the medical profession, a very few men having just finished an internship at some hospital, and a few men just out of college a year or two. But 90 per cent. of the men here are good men, who have been taking care of the sick and wounded from five to twenty-five years, have been successful both professionally and financially, and have sacrificed home comforts and incomes of from $2,000 to $20,000 a year. If these men can take care of the sick and wounded men at home I do not see why they are not capable of taking care of sick and wounded men in the Army.

Most of the good men under 30 that Major Derby speaks of are the ones that have made a financial failure of their profession. They are staying at home trying to get a practice by the other man's sacrifice. If Major Derby has a fair proportion of the men described in his company, I am glad that I do not belong to his company.

D. E. KISECKER, First Lieutenant, M. R. C.,
Fort Riley, Kan.

Responsibility.—Responsible behavior depends more on sound morals than anything else, and sound morals are sound habits due to sound parentage and a wholesome environment. —George Frederick Arps, *Scientific Monthly.*

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

APPARATUS FOR SPRAYING PARAFFIN

To the Editor:—Can you tell me where I can get apparatus for spraying paraffin on burns?

J. MORTIMER CROWE, M.D., Watertown, N. Y.

ANSWER.—The Caldwell Sprayer (described in THE JOURNAL, Aug. 4, 1917, p. 383) and the Pierce Paraffin Sprayer are marketed by the Max Wocher and Son Company, Cincinnati. The Abbott Laboratories of Chicago list an atomizer for melted wax. Also the DeVilbiss Manufacturing Company, Cleveland, makes an instrument for this purpose.

MEDICAL ITALIAN-ENGLISH BOOKS

To the Editor:—Can you inform me whether there are any special textbooks I could obtain or the purpose of acquiring a speaking vocabulary of medical Italian, such as would be of service to a physician practicing among Italian people?

PHILIP KATZEN, M.D., Brooklyn.

ANSWER.—

Thimm, F. J. L.: Italian Self-Taught, Dick & Fitzgerald, 18 Ann Street, New York, 25 cents.

Physicians' Interpreter: in English, French and Italian, F. A. Davis Company, 1914 Cherry Street, Philadelphia, $1.

Bimanski, F.: Italian for Use in the Clinic, 1076 West Twelfth Street, Chicago, 5 cents.

Waller, E.: English-Italian Phrase Book, Morristown, N. J., 75 cents; supplement, 25 cents.

Book Notices

THE SEX WORSHIP AND SYMBOLISM OF PRIMITIVE RACES: AN INTERPRETATION. By Sanger Brown, Jr., M.D., Assistant Physician, Bloomingdale Hospital. With an Introduction by James H. Leuba. Cloth. Price, $3 net. Pp. 145. Boston: Richard G. Badger, 1916.

This book, the greater part of whose first three chapters appeared in the *Journal of Abnormal Psychology*, was written with the object of giving the life history of a primitive motive in the development of the race, and to emphasize the dynamic significance of the motive. In the first chapter, on "Simple Sex Worship," the author shows that a simple form of sex worship has been quite generally found among the primitive races of mankind. "In the frank and open form of this worship, it is quite clear that we are dealing with a very simple type of mind." In the next chapter, on "Symbolism," the author says, "As civilization advanced the deification of sex was no longer frank and open. It came to be carried on by means of symbolism." He gives an account of various symbols to illustrate the wide prevalence of sex worship among primitive races, and to give a certain insight into the type of mind which evolves symbolism. In the third chapter, on "Sun Myths, Mysteries, and Decadent Sex Worship," the author discusses the decadence or degeneracy of this worship, which occurred after people had outgrown these simple religious conceptions. In the final chapter, on "Interpretations," the author analyzes the meaning of the worship of sex. He draws a parallelism between nature worship, actuated by the desire of primitive people to meet nutritive demands, and phallic rites which were an expression of the desire for human reproduction. He draws analogies between the individual and the race in a general way, referring to day dreaming of children in the normal person and "a tendency to utilize earlier adaptations, the reactions of infancy and childhood in meeting situations which arise in adult life," in the abnormal.

The book serves an excellent purpose in presenting in an acceptable form certain facts and explanations which, because of certain preformed ideas, have been objectionable to many people. It is interesting to the general reader and psychiatrist alike. Although indicating the author's trend of mind relative to the pathogenesis of certain morbid mental states, it does so in not quite the shape James H. Leuba wishes us to believe in his introduction, namely: "His theory is that we may expect diseased minds to reproduce, or return to expressions of desire customary and official in societies of lower culture."

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ARKANSAS: Little Rock, Nov. 13-14. Sec., Dr. T. J. Stout, Brinkley.

ARKANSAS: Eclectic: Little Rock, Nov. 13. Sec., Dr. C. E. Laws, 803½ Garrison Ave., Fort Smith.

CALIFORNIA: Los Angeles, Oct. 9-13. Secretary, Dr. Charles B. Pinkham, State Capitol, Sacramento.

CONNECTICUT: New Haven, Nov. 13-14. Sec., Dr. Charles A. Tuttle, 196 York St., New Haven.

CONNECTICUT: Homeopathic: New Haven, Nov. 13. Sec., Dr. E. C. M. Hall, 82 Grand Ave., New Haven.

CONNECTICUT: Eclectic: New Haven, Nov. 13. Pres., Dr. J. W. Fyfe, Saugatuck.

DISTRICT OF COLUMBIA: Washington, Oct. 9-11. Sec., Dr. Edgar P. Copeland, The Rockingham, Washington, D. C.

GEORGIA: Atlanta, Oct. 9-11. Sec., Dr. C. T. Nolan, Marietta, Ga.

ILLINOIS: Chicago, Oct. 9-11. Superintendent of Registration, Mr. F. C. Dodds, Springfield.

IOWA: Des Moines, Oct. 9-11. Sec., Dr. G. H. Sumner, State House, Des Moines.

MAINE: Portland, Nov. 13-14. Sec., Dr. Frank W. Searle, 776 Congress St., Portland.

MICHIGAN: Lansing, Oct. 9-11. Sec., Dr. B. D. Harison, 504 Washington Arcade, Detroit.

NATIONAL BOARD OF MEDICAL EXAMINERS: Chicago, Oct. 10-18. Sec., Dr. J. S. Rodman, 2106 Walnut St., Philadelphia.

NEVADA: Carson City, Nov. 5. Sec., Dr. S. L. Lee, Carson City.

NEW JERSEY: Trenton, Oct. 16-17. Sec., Dr. Alexander MacAlister, 438 E. State St., Trenton.

NEW MEXICO: Santa Fe, Oct. 8. Sec., Dr. R. K. McClanahan, East Las Vegas.

OKLAHOMA: Oklahoma City, Oct. 9-10. Sec., Dr. Ralph V. Smith, 502 Daniel Bldg., Tulsa.

SOUTH CAROLINA: Columbia, Nov. 13. Sec., Dr. A. Earle Boozer, 1806 Hampton St., Columbia.

TEXAS: Dallas, Nov. 20-22. Sec., Dr. M. F. Bettencourt, Mart.

WEST VIRGINIA: Clarksburg, Nov. 21-23. Chairman, Dr. S. L. Jepson, Capitol Bldg., Charleston.

WYOMING: Laramie, Oct. 10-12. Sec., Dr. H. E. McCollum, Laramie.

Drugless Healers in Illinois

One of the last acts of the Illinois State Board of Health, before its function as a licensing board ceased,[1] was to issue an official register of the "other practitioners," representatives of the various forms of drugless healing, who have been licensed in Illinois. The list contains 1,512 names, including practitioners of osteopathy, chiropractic, naprapathy, vitapathy, neuropathy, hydrotherapy, mechanotherapy, physculteopathy, magnetic healing and naturopathy. There were 146 for whom the particular form of practice was not given. Under the easy requirements of such practitioners in Illinois, it is not surprising that so many have been registered and that Illinois is the home of more drugless cult schools than exist in any other state. The former practice act of Illinois specified that "only those who are authorized to practice medicine and surgery in all their branches shall call or advertise themselves as physicians or doctors." But evidently no attempt was made to enforce this provision since drugless practitioners have made free use of the words "doctor" and "physician." The practice act also gave the board power to make examinations of drugless practitioners "of a character sufficiently strict to test their qualifications as practitioners." It was not until 1916, however, that these "other practitioners" were subjected to the same examinations as physicians in all subjects except materia medica, therapeutics, surgery and obstetrics. In the latter subjects special examinations were given and papers were graded by men licensed to practice the school of treatment advocated by each applicant. The new law places sufficient authority in the new Department of Registration and Education to make possible a better regulation of all practitioners of healing.

1. On July 1, 1917, the Department of Registration and Education, created by the Civil Administration Code of Illinois, assumed charge of the licensing of physicians, midwives, other practitioners et al., formerly a function of the state board of health.

Medicolegal

Liability of Employers for Services Rendered to Injured Employee

(Perkins vs. Kilpatrick et al. (Mo.), 193 S. W. R. 876)

The Kansas City (Mo.) Court of Appeals, in affirming a judgment in favor of the plaintiff for services rendered to an injured employee of the defendants, contractors in a quarry for furnishing rock to a railway company, says that the defendants relied much on the difference in a request for service from a physician and a request for other character of employment. If one is found in distress or serious sickness or injury, so that he is unable to care for himself, and is seen to be without professional help, it is the instinct of humanity for one observing such dire situation to call a physician; and it is not thought or expected, either by the physician or the one calling him, that a liability for services is incurred. But this case was more than that. When this employee was injured he was placed in a shanty nearby, and the defendants' regularly employed physician was put in charge of him. He remained there for two days, when the defendants' manager or superintendent sent him to a hospital where the plaintiff was a surgeon and had charge of patients, besides which he was division surgeon for the railway company and first knew of the injured man through its superintendent. The plaintiff began attendance on the man the day of his arrival at the hospital, and kept up his service for nearly two years; the defendants' physician having no part therein. During all this time the defendants knew of the serious injury the man had received. They knew of his removal to the hospital, and, of course, of their obligation to him. The court thinks this was a strong circumstance against their denial of liability, properly weighed by the jury. When the railway company learned that the man was not its employee, its superintendent caused its manager at the quarry to seek information concerning the defendants' liability for the plaintiff's services. The manager subsequently received a letter from "Kilpatrick Bros., by W. C. Rich," saying: "Replying to yours of the 16th inst. You may bill on us to cover the expense of the hospital treatment in connection with the case of Benjamin Funk, the man who was injured," etc. There were but two ways to avoid this letter; one to deny Rich's authority, and the other to insist that it could not affect the plaintiff's claim except for the services after its date. Rich was shown to be the defendants' timekeeper, but it was also shown that he signed checks, attended to correspondence, and signed letters for the defendants. There was abundant room for the jury to find authority. The letter, connected with the other evidence, was ample to show a liability for the plaintiff's services, not merely from the date of the letter, but the whole service. The court agrees with the defendants that the mere fact that they collected a fund out of the wages of employees would not necessarily make them liable to the plaintiff or any other particular persons for services. But it was a proper circumstance to be considered by the jury. The question in the case was essentially one of fact, and the court thinks it was shown by abundant evidence, the circumstances considered, that the defendants knew of their obligation to the plaintiff, and through their accredited agent promised to pay him.

Without Power to Compel Vaccination

(Waldschmidt et al. vs. City of New Braunfels et al. (Tex.), 193 S. W. R. 1077)

The Court of Civil Appeals of Texas reverses a judgment obtained by the defendants, and in its stead renders one that they be enjoined from excluding from the public schools of New Braunfels the children of plaintiff Waldschmidt because they had not complied with a city ordinance requiring a certificate of vaccination for admittance to schools, said plaintiff and children being Christian Scientists. That the state, through its legislature, may, in the exercise of its police power, enact all reasonable legislation for the promotion of the public welfare, including the preservation of health, the court says is too well settled to require citation of authorities. Also that the reasonableness of such measures is primarily a question for the legislature, and will be reviewed by the courts only in clear cases of abuse of such power, is equally well settled. In reference to this rule, as applied to vaccination, courts have frequently said that they were not called on to decide whether or not vaccination was a preventive of smallpox, but only whether the legislature which enacted such legislation had reason to so believe. But the rule is quite different where local authorities have undertaken to pass rules or ordinances with reference to vaccination, without being expressly authorized so to do. Municipal corporations are the creatures of statute, and have no powers except those expressly or impliedly granted by the statute creating them.

The legislature of Texas has never enacted a law to exclude any one from school who has not been vaccinated, nor has it expressly authorized any city council, board of school trustees, or even the state board of health, composed as it is of eminent physicians, to do so. The power to pass the ordinance above referred to is not to be implied from article 838 of the revised statutes, which reads: "To do all acts and make all regulations which may be necessary or expedient for the promotion of health or the suppression of disease." That means only that city councils may "do all acts and make all regulations which may be necessary or expedient" to carry into effect the powers expressly granted them "for the promotion of health or the suppression of disease." Anything that they might do in attempting to carry into execution the powers expressly granted would be sustained by the courts, unless it was clearly shown to be unreasonable. Moreover, the court thinks that the compulsory education law, with its penalty of fines, furnishes another reason, and a cogent one, why it should not be held in Texas that city councils have implied authority to exclude from public schools all who have not been vaccinated. A number of exemptions and excuses are provided for in the act, among which is quarantine, but failure to have been vaccinated is not one of them.

That the state may disregard religious opinions when necessary so to do to protect morals is the effect of the decisions in reference to polygamy as taught by the Mormon church. Whether or not this would apply to compulsory vaccination, the court is not called on to decide. The state has not attempted, either directly or indirectly, to compel any one to be vaccinated, nor has it authorized any municipal corporation to do so.

If, however, it be conceded that the city had implied authority to pass and enforce the ordinance at the time of its passage, such authority arose from the prevalence of smallpox in the city in epidemic form, or its threatened invasion at that time. Courts so holding limit such authority to the continuance of the emergency. So the question was: What was the condition in regard to smallpox in the city when this case was tried? The undisputed testimony showed there was then but one case of smallpox in the city, and it was isolated and practically convalescent. That a portion of the population was Mexican, and that smallpox was of frequent occurrence in San Antonio, 28 miles distant, would not justify the enforcement of the ordinance. A rehearing was denied.

Society Proceedings

COMING MEETINGS

Amer. Acad. of Ophthal. and Oto-Laryng., Pittsburgh, Oct. 29-30.
Am. Assn. for Study and Prev. of Inf. Mort., Richmond, Va., Oct. 15-17.
American Association of Railway Surgeons, Chicago, Oct. 17-19.
Clinical Congress of Surgeons, Chicago, Oct. 22-26.
Delaware State Medical Society, Middletown, Oct. 8-9.
Kentucky State Medical Association, Louisville, Oct. 16-18.
Medical Association of the Southwest, Kansas City, Oct. 15-17.
Minnesota State Medical Association, St. Paul, Oct. 10-12.
Mississippi Valley Medical Association, Toledo, O., Oct. 9-11.
Nevada State Medical Association, Reno, Oct. 18-19.
New Mexico Medical Society, Las Cruces, Oct. 4-6.
Southern Medical Association, Memphis, November 12-15.
Vermont State Medical Society, Barre, Oct. 11-12.
Virginia State Medical Society, Roanoke, Oct. 23-26.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

Annals of Ophthalmology, St. Louis

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1 Comfort Test as Method of Refraction. P. Potter, Butte, Mont. —p. 391.
2 Cataract Operations. J. J. Smith, San Francisco.—p. 404.
3 Use of Sophol in Prevention of Ophthalmia Neonatorum. I. F. Stein, Chicago.—p. 411.
4 Operation for Anterior Synechia; Report of Cases of Secondary Glaucoma and Staphyloma in Which It Was Used. C. G. Darling, Chicago.—p. 416.
5 Choroiditis of Therapeutically Proved Dental Origin. H. S. Gradle, Chicago.—p. 419.
6 Glaucoma and Autointoxication. C. W. Hawley, Chicago.—p. 421.
7 Do Moving Pictures Injure the Eyes? C. A. Bahn, New Orleans. —p. 427.
8 Intraventricular Injection of Antisyphilitics in Primary Optic Atrophy; Report of Case. M. Goldenburg, Chicago.—p. 433.

Annals of Otology, Rhinology and Laryngology, St. Louis

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9 Surgical Consideration of Upper Paranasal Cells. G. Sluder, St. Louis.—p. 353.
10 Asthma Associated with Ethmoidal Disease. J. M. Brown, Los Angeles.—p. 397.
11 Report of Three Cases of Brain Abscess of Otitic Origin. G. M. Coates, Philadelphia.—p. 408.
12 Severe Epistaxis in Woman with Diabetes, Myomas of Uterus and Acute Mastoiditis. W. Freudenthal, New York.—p. 416.
13 Septal Hemorrhage; Its Cure by Submucous Elevation. J. Leshure, New York.—p. 420.
14 Some Interesting Labyrinth and Eighth Nerve Cases. H. B. Graham, San Francisco.—p. 426.
15 Acute Suppurating Mastoiditis without Tympanitis, Perisinus Abscess, Phlebitis, Streptococcemia, Operation, Recovery. C. H. Long, Chicago.—p. 432.
16 Practical Uses of Recent Work on Internal Ear, to General Practitioner, Otologist, Ophthalmologist, Syphilologist, Neurologist and Surgeon. I. H. Jones, Philadelphia.—p. 436.
17 Observations on After-Turning Nystagmus. G. W. Mackenzie, Philadelphia.—p. 445.
18 Vertigo; Its Causes and Methods of Diagnosis. L. Fisher, Philadelphia.—p. 511.
19 Use of Electric Cautery in Nose. W. A. Hitschler, Philadelphia. —p. 519.
20 Facial Paralysis as Complication of Acute Otitis Media. E. B. Jones, Washington, D. C.—p. 523.
21 Primary Jugular Thrombosis Due to Tonsil Infection. C. Goodman, New York.—p. 527.
22 Transillumination of Larynx and Upper Trachea. F. R. Spencer, Boulder, Colo.—p. 530.
23 Relations of Sphenoid Sinus to Semilunar (Gasserian) Ganglion and Their Possible Clinical Importance. G. Sluder, St. Louis. —p. 537.
24 Is Modified Radical, or Health Operation, Justifiable Procedure? A. S. Kaufman, Philadelphia.—p. 543.
25 Case of Acute Mastoiditis with Enormous Leukocyte Count; Both Mastoids Opened; Recovery. G. F. Keiper, La Fayette, Ind. —p. 548.
26 Obscure Case of Sigmoidal Sinus Thrombosis. T. H. Odeneal, Beverly, Mass.—p. 552.
27 Complicated Gradenigo's Syndrome; Operation; Recovery. A. Dighton, Liverpool.—p. 554.

Archives of Internal Medicine, Chicago

September, XX, No. 3

28 *Etiologic Agent of Rat Bite Disease. J. Kitagawa and T. Mukoyama, Nagoya, Japan.—p. 317.
29 *Salicylates. Salicyl Edema. P. J. Hanzlik, R. W. Scott and J. L. Reycraft, Cleveland.—p. 329.
30 Study of Poliomyelitis. Report of Work of Meningitis Division of Research Laboratory in 1916 Epidemic. J. B. Neal, H. L. Abramson and Associates, New York.—p. 341.
31 Studies with Schick Test. A. Zingher, New York.—p. 392.
32 *Effect of Undernutrition on Muscular Force. Study of Influence of Low Diets, or Allen Method of Treatment on Physical Vigor of Diabetics. J. R. Williams, Rochester, N. Y.—p. 399.
33 *Auricular Flutter. Study of Case, and of Literature. J. D. Heard, Pittsburgh, and A. E. Strauss, St. Louis.—p. 409.
34 Clinical Studies on Respiration. Mechanical Factor in Production of Dyspnea in Patients with Cardiac Disease. F. W. Peabody, Boston.—p. 433.
35 *Id. Vital Capacity of Lungs and Its Relation to Dyspnea. F. W. Peabody and J. A. Wentworth, Boston.—p. 443.
36 *Id. Basal Metabolism and Minute-Volume of Respiration of Patients with Cardiac Disease. F. W. Peabody, J. A. Wentworth and B. I. Barker, Boston.—p. 468.

28. **Etiology of Rat Bite Disease.**—The two types of spirochetes, found by Kitagawa and Mukoyama in the guinea-pigs and rat, respectively, not only varied considerably with respect to size, but also showed differences with regard to the distinctness of the spirals and the pointedness of the ends, which facts seem to us to indicate that these spirochetes belong to two different species. Yet, since the staining brought out no definite distinctions between them, and as they showed practically the same number of curves, it appears possible that the above mentioned difference of form was a result of the differences existing between the inoculated animals, or that the spirochetes may have been in different stages of development. At all events, it is interesting to note that the spirochetes obtained from inoculation with the lymph gland and the lymph plasma derived from the same patient also appear to be of different sizes. Whether Type A and Type B are really identical, or, if they are not, which one is the etiologic agent, are points which must be determined.

29. **Salicyl Edema.**—It is claimed by the authors that the anuria produced by the administration of full therapeutic doses of salicylate is due to retention of water as indicated by an increase in body weight unless modified by diaphoresis. This retention is demonstrable about twenty hours after the start of administration of the salicylate and persists until the salicyl excretion is completed, that is, about eighty hours (three and one-third days). The retention occurs chiefly in the tissues, for no dilution of the blood is demonstrable by estimations of hemoglobin. The edema is accompanied by a diminution in phenolsulphonephthalein excretion together with an accumulation of urea nitrogen of the blood, and increased excretion of albumin, all of these elements reaching their previous levels with the disappearance of the edema. There is, therefore, a diminution in renal functional efficiency, and since this generally makes its appearance before an actual increase in body weight is demonstrable (edema) and later coincides with it, it seems that the renal factor plays an important rôle in the production of the edema. These phenomena are not modified by the administration of sodium bicarbonate together with the salicylate, and in doses sufficient to maintain the urine alkaline.

32. **Effect of Undernutrition on Muscular Force.**—Williams' investigation supports the common clinical observation that diabetics, as a rule, are distinctly physically weaker than normal persons. Loss of body musculature may partly explain this, but it is probable that the lessened amount of food metabolized in these cases does not provide sufficient energy for the normal exercise requirements of the body. There appears to be a direct relationship between food tolerance and muscular vigor. As food tolerance increases, so does also muscular tone. Decline in food tolerance is accompanied by loss of physical vigor. The continued use of a low diet for many months, even though it fall far short of the energy requirements of the body, provided it is within the physiologic limitations of the body to metabolize it, will cause an appreciable gain in muscular tone, although the amount of physical effort that such a person may be able to put forth may be considerably below normal. These observations also show that while diabetics living on a diet below normal physiologic requirements possess a diminished muscular vigor, feeding them beyond their metabolic limitations causes not only a further reduction in their tolerance for food, but also an even greater loss of strength. This is contrary to the view commonly held by both physicians and laymen. There is no justification for the common notion that overfeeding causes even a temporary increase in comfort or body strength. The general conclusion from this inquiry is that diabetics gain in physical vigor as they become and remain sugar free, while overfeeding causes a definite and often a serious loss of strength. Attention is called to the use of the dynamometer as a simple and fairly trustworthy method of measuring muscular tone or physical vigor.

33. **Auricular Flutter.**—A case is presented by Heard and Strauss which shows most of the well known characteristics of auricular flutter. The contour of the P deflection is discussed. The origin of auricular impulses is believed to be ectopic. The usual difficulties were encountered in the mea-

surement of A_a-V_a interval in flutter. The A_a-V_a interval was prolonged by digitalis in flutter as in normal mechanism. Emphasis is laid on the variation of auricular rate as found in the individual case of flutter, a fact which has been usually overlooked. Blood pressure studies showed marked daily variation of the systolic pressure as observed during flutter and fibrillation. There was a marked constancy of the diastolic pressure. Vagus stimulation by pressure, either over carotid artery or eyeball, produced ventricular slowing or standstill, as has been noted by previous observers. Vagus stimulation produced like results in fibrillation and in flutter. The prolongation of the refractory stage of heart muscle under the influence of repeated stimuli is noted as a possible explanation of the auriculoventricular dissociation in flutter and fibrillation. Finally, the effect of digitalis during treatment—its very early effect on conduction, its possible effect on auricular rate, the change in the T wave, and the large amount necessary to change the mechanism to fibrillation—is considered at some length.

35. **Vital Capacity of Lungs and Its Relation to Dyspnea.**—Observations on patients with heart disease show that there is a close relation between decrease in vital capacity and the tendency to dyspnea. Compensated patients, who do not complain of dyspnea on exertion, have a normal vital capacity. Patients with more serious disease, in whom dyspnea is a prominent symptom, have a low vital capacity, and the decrease in vital capacity runs parallel to the clinical condition. Changes in the clinical condition are usually associated with changes in the vital capacity. As a patient improves, his vital capacity tends to rise, and as he becomes worse, it tends to fall. Determinations of the vital capacity in cases of cardiac disease are often of practical value as they give quantitative information as to the tendency to dyspnea, and thus, indirectly, as to the clinical condition and the reserve power of the patient. In various other diseases in which mechanical conditions interfere with the movements of the lungs, the tendency to dyspnea corresponds closely to the decrease in the vital capacity. This is, however, apparently not true of the anemias. In diseases in which dyspnea is not a prominent symptom the vital capacity is usually within the normal limits, although general weakness and old age may cause a slight decrease.

36. **Basal Metabolism and Respiration of Patients with Cardiac Disease.**—Observations are reported on the gaseous metabolism and pulmonary ventilation of two groups of patients with heart disease. Group 1 consists of subjects in good or fairly good condition, in whom the vital capacity of the lungs was over 60 per cent. of the normal. Group 2 consists of much more severely affected patients in whom the vital capacity was 60 per cent. of the normal or less. The basal metabolism calculated from the oxygen consumption per square meter of body surface averaged 2.5 per cent. above normal in Group 1, and 12.8 per cent. above normal in Group 2. The average volume per respiration was less in Group 2 than in Group 1, and the average rate of respiration was higher in Group 2 than in Group 1. The minute volume of air breathed averaged approximately 30 per cent. higher in the members of Group 2 than it did in those of Group 1. The relation is pointed out between the increase of the minute volume of the more seriously affected patients and the decrease in the vital capacity of the lungs. Finally it is shown that this high minute volume is a factor in the production of dyspnea in persons with severe heart disease.

Boston Medical and Surgical Journal

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37 Use of Paraffin Preparations in Treatment of Burns. E. H. Risley, Boston.—p. 343.

38 *Treatment of Old Ununited Fracture of Neck of Femur by Transplantation of Head of Femur to Trochanter. E. G. Brackett and M. S. New, Boston.—p. 351.

39 *Spina Bifida and Allied Malformations: Thirty-Four Cases. T. W. Harmer, Boston.—p. 353.

40 *Results of Radium Treatment at Collis P. Huntington Memorial Hospital by Cancer Commission of Harvard University. W. Duane and R. B. Greenough, Boston.—p. 359.

41 Mesothorium and Combination Methods in Treatment of Cancer. F. D. Donoghue, Boston.—p. 365.

42 Roentgen Diagnosis of Pathologic Gallbladder. A. W. George and R. D. Leonard, Boston.—p. 375.

38. **Treatment of Ununited Fracture of Neck of Femur by Transplantation of Head of Femur to Trochanter.**—The method considered by Brackett and New treats the femoral head as if it were a real sequestrum. The head is placed on the inner side of the top of the sawed off trochanter, and in this way the thrust is passed directly from the shaft to the head, so that there is little or no distraction strain in weight bearing, and the head has its most favorable position for a restored function. There is one contraindication. Sometimes, after joint injury, particularly in the older people, there is found a distinct osteo-arthritic change, with thinning of cartilage, as well as the tendency to overgrowths. Under these conditions, a favorable functional result could not be expected, and this operation must not be advised.

39. **Spina Bifida and Allied Malformations.**—Harmer's series includes seven meningoceles, twenty-three myelomeningoceles, three hydroencephaloceles, and one encephalocele. Twenty-three were rounded and sessile, eight rounded and pedunculated, and three flat. Twenty cases exhibited some degree of paralysis. Of these, the paralysis was increased after operation in three, it was not affected by operation in nine, and improved or cured in eight. In five of these eight the benefit was unimportant, for all died subsequently of acute hydrocephalus or meningitis. However, the paralysis which they exhibited before operation was lessened or disappeared up to the time of death. Three of these patients are still living. One patient exhibited prolapse of the rectum and incontinence of urine and feces. Now, fifteen months later, there is no prolapse, and the mother is convinced that there is increasing control of bladder and rectum. Another case exhibited sensory paralysis of both legs, motor paralysis of right foot, and prolapsed rectum before operation. The motor paralysis of the foot and the prolapse are cured but sensation in the legs is still impaired. The third case presented a myelomeningocele in the sacral region, with leaking sac and paralysis of both feet when seen twenty-four hours after birth. Operation was done at once and the child is perfectly well sixteen months later. Sixteen patients died; eighteen patients were discharged alive; a mortality of 47 per cent. The causes of death were shock, one; acute hydrocephalus, one; continued loss of cerebrospinal fluid, four; umbilical septicemia, one; meningitis, nine. Therefore, deducting the case which died of umbilical septicemia, the operative mortality is 44.1 per cent. Sixty-four and seven-tenths per cent. of the cases exhibited ulcerated or leaking sacs. Of the cases discharged alive, four exhibited some degree of paralysis, three increasing hydrocephalus, ten were well. Of the well cases, three were myelomeningoceles, all with ulcerated or leaking sacs; four were meningoceles with intact coverings, and four were encephaloceles.

40. **Results of Radium Treatment.**—Of 642 cases treated with radium, 354, or 55 per cent., received definite benefit.

Bulletin of Johns Hopkins Hospital, Baltimore

September, XXVIII, No. 319

43 Embryomas in Plants. Produced by Bacterial Inoculations. E. F. Smith, Washington, D. C.—p. 277.

44 Carrel Treatment of Wounds Applied to Civil Practice. J. S. Lawrence.—p. 294.

45 Placental Transmission; Total Creatinin in Plasma, Whole Blood and Corpuscles of Mother and Fetus. E. D. Plass, Baltimore. —p. 297.

Bulletin of Lying-In Hospital of City of New York

August, XI, No. 3

46 *Accidental Hemorrhage from Premature Separation of Placenta. J. A. Harrar, New York.—p. 151.

47 Control of Uterine Hemorrhage. A. B. Davis, New York.—p. 158.

48 Case of Cystic Lymphangioma in Newborn. R. McPherson, New York.—p. 165.

49 Asepsis in Obstetrics in Tenements. J. W. Markoe, New York. —p. 167.

50 Attitude and Responsibilities of Physician in So-Called Birth Control Movement. G. W. Kosmak, New York.—p. 181.

51 Cesarean Section for Congenital Partial Occlusion of Vagina. E. D. Truesdell, New York.—p. 199.

52 Case of Placenta Praevia in Twin Pregnancy. M. Rosensohn, New York.—p. 200.

46. **Accidental Hemorrhage from Premature Separation of Placenta.**—Among 100,000 confinements at the New York

Lying-In Hospital premature separation of the placenta took place in 254 cases, the accident occurred twice as frequently in multiparae as in primiparae. In the 152 instances of marked hydramnios in the 100,000 labors, premature separation of the placenta occurred but three times; in 1,478 cases of twins premature separation of the placenta occurred but four times; in twenty-nine cases of triplets it occurred twice. In five instances of premature separation there was evidence of an antenatal infection with elevation of temperature and a foul odor to the uterine contents when delivered. External trauma was a feature in fifteen cases, fibroids in three and a short cord in two. Twenty-two deaths occurred in the 254 cases, a maternal mortality of 8.66 per cent. The mortality was considerably higher in the so-called "concealed" hemorrhage cases. There were twenty-four cases of disruptive concealed hemorrhage with six deaths, a mortality of 25 per cent. Eighteen of these, however, showed some external bleeding as well. In the six with absolutely concealed hemorrhage of the disruptive type but one died, and this one apparently died of an accompanying eclampsia. There were 133 stillbirths, a fetal mortality of 50.8 per cent. in the 262 babies born. Thirty infants died in the first ten days, making a total fetal and infantile mortality of 62.2 per cent. In the concealed hemorrhage group the only child that survived was delivered by cesarean section.

As to the treatment and method of delivery of these 254 cases of accidental hemorrhage; sixty-eight delivered themselves spontaneously after simple rupture of the membranes, with two late deaths, both due to infection; twenty-seven delivered themselves spontaneously after the insertion of a cervicovaginal packing of iodoform gauze, with no deaths; eight spontaneously after the use of a Voorhees bag with one immediate death, due to hemorrhage and eclampsia. Version was performed eighty-one times with ten maternal deaths. It was done fourteen times after cervicovaginal packing, twenty-two times after manual dilatation of the cervix, and twenty times as part of an accouchment forcé. Forceps completed the delivery in twenty-nine cases with three deaths. Breech extraction was done nineteen times. Vaginal cesarean section was done five times with one death. Abdominal cesarean section was done seven times with no maternal death. The highest mortality occurred in the group of cases in which version was done after forcible manual or instrumental dilatation of the cervix. Harrar recommends in the treatment of accidental hemorrhage, rupture of the membranes in the very mild cases, rupture of membranes and the use of the cervicovaginal packing in the more severe cases, reserving the use of the abdominal cesarean section in the grave concealed hemorrhage cases with closed cervix, and doing a hysterectomy only when there is accompanying partial or complete rupture of the uterus.

California State Journal of Medicine, San Francisco

September, XV, No. 9

53 Case of Splenectomy in Pernicious Anemia. H. M. Sherman, San Francisco.—p. 338.
54 Some Unusual Aspects of Exophthalmic Goiter; Case Reports. G. D. Barnett, San Francisco.—p. 342.
55 Disability from Injury to Feet. G. J. McChesney, San Francisco. —p. 344.
56 Therapeutic Application of Hypertonic Salt Solution in Conjunction with Leukocytic Extract. R. A. Archibald and G. Moore, Oakland.—p. 345.
57 Intestinal Crises Simulating Chronic Appendix Disease Diagnosed by Roentgen Ray Findings. M. P. Burnham and L. B. Crow, San Francisco.—p. 348.
58 Aneurysm. C. D. Lockwood, Pasadena.—p. 352.
59 Uterine Fibromyomas, Their Causation, Prevention and Conservative Treatment; Case Reports. W. A. Briggs, Sacramento.—p. 354.
60 Modern Treatment of Bladder Tumors. M. Krotoszyner, San Francisco.—p. 359.
61 Tumors of Kidney. S. Stillman, San Francisco.—p. 363.
62 Treatment of Drug and Alcoholic Addictions. A. C. Matthews, Napa.—p. 366.
63 Patent Medicine Evil. P. K. Brown, San Francisco.—p. 371.
64 Abortion Evil in Small Town. W. B. Smith, Randsburg.—p. 374.
65 Use of Aspirator for Removing Pus, Blood, Exudate, Transudate and Bowel Contents During Surgical Operations. E. Butler, San Francisco.—p. 375.
66 Practical Roentgenography for General Practitioner. A. Soiland, Los Angeles.—p. 376.

Delaware State Medical Journal, Wilmington

September, VIII, No. 9

67 Medical Science in Its Relation to Crime. W. H. Kraemer, Wilmington.—p. 4.
68 Spinal Anesthesia. J. A. Mendelson, New York.—p. 7.

Illinois Medical Journal, Chicago

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69 Treatment of Catarrhal Deafness. M. F. Arbuckle, E. St. Louis. —p. 153.
70 What State Can Do to Prevent Blindness. W. O. Nance, Chicago. —p. 155.
71 New Method of Dealing with Nasal Septum. J. A. Cavanaugh, Chicago.—p. 161.
72 Treatment of Membranous Cataract. H. W. Woodruff, Joliet. —p. 164.
73 Primary Mastoiditis; Report of Case. R. Sonnenschein, Chicago. —p. 167.
74 Depressed Nasal Deformities Corrected by Bone Transplantation. L. Ostrom, Rock Island.—p. 169.
75 Radical Mastoid Operation—Its Terminations—With Special Reference to Hearing and Suppuration. C. H. Long, Chicago.—p. 171.
76 Kronlein Operation; Report of Case. E. E. Edmondson, Mount Vernon.—p. 175.
77 Operation for Anterior Synechia Used in Cases of Secondary Glaucoma and Staphyloma. C. G. Darling, Chicago.—p. 177.
78 Use of Trichloracetic Acid in Atrophic Rhinitis. W. G. Hatch, Rockford.—p. 178.
79 Diagnosis of Acute Mastoiditis and Indications for Operation. A. E. Sherman, Aurora.—p. 179.
80 Interpretation of Findings of Transilluminator. W. G. Reeder, Chicago.—p. 181.
81 How Eye and Ear Service in General Hospitals Can Be Improved. F. Allport, Chicago.—p. 182.
82 Treatment of Vitreous Opacities. W. H. Peck, Chicago.—p. 186.
83 Importance of After-Treatment of Tonsillar Fossa During Secondary Period Following Tonsillectomy. C. F. Burkhardt, Effingham.—p. 188.
84 Decompression Operation on Hypophysis by Nasal Route. O. J. Stein, Chicago.—p. 192.
85 Management of Malignant Diseases of Upper Respiratory Tract. J. C. Beck, Chicago.—p. 194.

Journal of Biological Chemistry, Baltimore

September, XXXI, No. 3

86 *Modification of McLean-Van Slyke Method for Determination of Chlorids in Blood. G. L. Foster, Boston.—p. 483.
87 *Function of Muscular Tissue in Urea Formation. R. Hoagland and C. M. Mansfield, Washington, D. C.—p. 487.
88 *Glycolytic Properties of Muscular Tissue. R. Hoagland and C. M. Mansfield, Washington, D. C.—p. 501.
89 Tables for Finding Alkaline Reserve of Blood Serum, in Health and in Acidosis, from Total Carbon Dioxid or Alveolar Carbon Dioxid or pH at Known Carbon Dioxid Tension. J. F. McClendon, A. Shedlov and W. Thomson, Minneapolis.—p. 519.
90 Effect of Temperature on Reaction of Lysin with Nitrous Acid. B. Sure and E. B. Hart, Madison, Wis.—p. 527.
91 *Methods for Determination of Blood Sugar in Reference to Its Condition in Blood. H. McGuigan and E. L. Ross, Chicago. —p. 533.
92 *Origin of Creatin. L. Baumann and H. M. Hines, Iowa City, Iowa.—p. 549.
93 *Production of Creatinuria in Normal Adults. W. Denis and A. S. Minot, Boston.—p. 561.
94 *Experimental Studies on Growth. Influence of Tethelin on Early Growth of White Mouse. T. B. Robertson and M. Delprat, Berkeley, Calif.—p. 567.
95 *Blood Lipoids in Nephritis. W. R. Bloor, Boston.—p. 575.
96 *Dynamics of Process of Death. W. J. V. Osterhout, Cambridge. —p. 585.
97 Structure of Yeast Nucleic Acid. P. A. Levene, New York. —p. 591.
98 Removal of Nitric Acid from Solutions or Organic Compounds. P. A. Levene and G. M. Meyer, New York.—p. 599.
99 Preparation of Lyxose. E. P. Clark, New York.—p. 605.
100 Chondrosamin and Its Synthesis. P. A. Levene, New York.—p. 609.
101 Relation between Configuration and Rotation of Epimeric Monocarboxylic Sugar Acids. The Phenylhydrazides. P. A. Levene and G. M. Meyer, New York.—p. 623.
102 Cerebrosids. Conditions for Hydrolysis of Cerebrosids. P. A. Levene and G. M. Meyer, New York.—p. 627.
103 Id. Cerasin. P. A. Levene and C. J. West, New York.—p. 635.
104 Id. Cerebrosids of Kidney, Liver and Egg Yolk. P. A. Levene and C. J. West, New York.—p. 649.

86. **Determination of Chlorids in Blood.**—Foster found that thoroughly reliable results are obtained by applying the original McLean-Van Slyke titration to the filtrates obtained after coagulating the blood proteins with metaphosphoric acid. The additional acidity due to the metaphosphoric acid is not sufficient to interfere with the sensitiveness of the starch iodin end-point, being only about 2 per cent. of that due to

the nitric acid. The coagulum formed by the addition of meta phosphoric acid to the diluted blood or plasma is very finely divided, and the diffusion of chlorids to uniform concentration throughout the mixture is complete in ten minutes if the flask is shaken occasionally.

87. **Muscular Tissue and Urea Formation.**—The purpose of the experiments reported by Hoagland and Mansfield was to determine whether or not urea-forming enzymes are present in muscular tissue. Taken as a whole, the results show that urea formation is not an important function of muscular tissue. In view of the well established fact that the liver plays an important part in the formation of urea in the body, these findings lend support to the view that urea production is chiefly a function of that organ.

88. **Glycolysis of Muscular Tissue.**—According to Hoagland and Mansfield muscular tissue autolyzed under aseptic conditions shows appreciable glycolytic properties. Glycolysis takes place most rapidly within a comparatively few hours after the death of the animal. The glycolysis that took place under the conditions of these experiments did not result in the production of carbon dioxid. Muscular tissue apparently has the ability to synthesize carbohydrates. In part at least, and probably in their entirety, the processes by which sugars are utilized by the animal body are enzymatic in nature.

91. **Determination of Blood Sugar.**—The work done by McGuigan and Ross corroborates the work of von Hess and McGuigan, showing that the sugar in the blood reacts as it does in a water solution.

92. **Origin of Creatin.**—The authors do not offer any evidence for the methylation of glycocyamin by muscle or liver tissue in vitro. The injection of glycocyamin into rabbits and dogs may be followed by an increased excretion of creatin.

93. **Creatinuria in Normal Adults.**—In two normal women Denis and Minot were able to cause creatin excretion by feeding a high protein (creatin free) diet, and to cause the creatinuria so produced to disappear by the consumption of a low protein diet. In two men to whom a similar experimental procedure was applied the authors were unable to produce creatin excretion even when a sufficient amount of protein was consumed to cause the urinary nitrogen to rise to 34.5 gm. per day.

94. **Effect of Tethelin on Early Growth.**—From the total lack of effect of the administration of tethelin to the mother on the growth of suckling young the authors believe that one may infer either that tethelin exerts no effect on growth during the first (infantile) growth cycle or else, which is more probable, that the tethelin administered to the mother is not secreted as such to any appreciable extent by the mammary glands of the mother. The administration of tethelin to the young subsequently to the fourteenth day, when their eyes are open and they have access to food other than that supplied to the mother, results in a noticeable acceleration of growth during the second growth cycle (second to the fifth weeks), followed on initiation of the third cycle, by a marked retardation which evidences itself despite the fact that the administration of tethelin is discontinued at the end of the fifth week.

95. **Blood Lipoids in Nephritis.**—The abnormalities in the blood lipoids in severe nephritis were found to be high fat in plasma and corpuscles and high lecithin in the corpuscles. The cholesterol values were practically normal. These abnormalities are the same as are found in alimentary lipemia and for this reason are regarded by Bloor as the result of a retarded assimilation of fat in the blood, which in turn is thought to be one manifestation of a general metabolic disturbance brought about by a lowered "alkali reserve" of the blood and tissues.

96. **Dynamics of Process of Death.**—Osterhout found that by measuring the electric conductivity of tissues placed in toxic solutions the process of death can be followed in the same manner as the progress of a reaction in vitro. Death proceeds as a monomolecular reaction which is somewhat inhibited at the start. This is easily explained if consecutive reactions are involved in the process of death. This explanation also applies to many other cases of toxic action. In all these cases death behaves as a reaction which is continually going on and which is accelerated by the toxic agent.

Journal of Medical Research, Boston

September, XXXVII, No. 1

105 *Periarteritis Nodosa; Report of Two Cases. O. Klotz, Pittsburgh. —p. 1.
106 *Treatment with Bacterial Vaccines of Bronchial Asthmatics Who Are Not Sensitive to Proteins. I. C. Walker, Boston.—p. 51.
107 *Erythrocytic Origin of Blood Platelets. V. E. Emmel, Chicago. —p. 67.
108 Factors which Determine Movements of Tissues in Culture Media. L. Loeb and M. S. Fleisher, St. Louis.—p. 75.
109 *Studies on Common House Fly (Musca Domestica, Linn). Bacteriology of House Fly in District of Columbia. J. R. Scott. —p. 101.
110 *Id. Isolation of B. Cuniculicida; Unreported Isolation. J. R. Scott.—p. 121.
111 *Production of Acute and Chronic Kidney Lesions with Bacillus Mucosus Capsulatus. R. H. Major, Rosedale, Kan.—p. 125.
112 *Phagocytosis in Vivo under Various Conditions. C. J. Bartlett and Y. Ozaki, New Haven, Conn.—p. 139.
113 Preparation of Hemoglobin for Clinical Investigations. A. W. Sellards and G. R. Minot, Boston.—p. 161.
114 *Myeloma with Metastasis to Liver and Spleen. O. H. P. Pepper and R. M. Pearce, Philadelphia.—p. 171.
115 *Problem of Acid-Fast Organisms in Distilled Water. R. A. Keilty, Philadelphia.—p. 183.

105. **Periarteritis Nodosa.**—Two cases of periarteritis nodosa are added by Klotz to the forty cases previously recorded in the literature. The first case was a woman 33 years of age, whose past history does not bear on her final illness. Syphilis was not considered as a possible factor, so that a Wassermann was not performed. Her final illness was of four weeks' duration, beginning with a severe cold following exposure to inclement weather. Muscle and joint pains were prominent, and subsequently these were followed by severe, cramp-like pains in the abdomen. She ran a continuous temperature over 100 F. There was some leukocytosis and albuminuria and slight icterus. Death occurred suddenly in collapse. The necropsy revealed the typical lesions of periarteritis nodosa with aneurysms and thromboses distributed along the hepatic and cystic arteries. Rupture of one of these hepatic arteries led to extensive hemorrhage about the liver and into the peritoneum. There were no other serious acute lesions nor were there any infectious deposits about the heart.

The second case occurred in a man 53 years of age, who previously had suffered considerable illness. He had had acute rheumatic fever. His present illness began after an exposure to rain and cold, from which he was slow in recovering. During his illness he developed tonsillitis, which in a few days was followed by the appearance of bluish nodules in the skin. Dyspnea and cyanosis were evident throughout his illness, apparently associated with an old cardiac lesion. His Wassermann reaction was positive. He had quite a marked anemia, with some leukocytosis. From the time of the onset of his tonsillitis, he ran a continuous through irregular temperature over 100 F. During life one of the skin nodules was removed, but a diagnosis of the arterial lesion could not be made owing to the rather extensive disintegration and hemorrhage which occupied the area excised. Cultures from these nodules were negative, as were also the blood cultures. Clinical manifestations of an intra-abdominal condition were not apparent. The patient died rather unexpectedly, although during the last week of his illness, he was becoming progressively weaker. His total illness extended over a period of about three months. It is evident that the patient was primarily suffering from a cardiac lesion of not uncommon type, and that the acute periarteritis was an associated complication superadded to his other illness.

106. **Vaccine Treatment of Bronchial Asthma.**—The fifteen patients who were treated by Walker are placed into three groups: Group I, six patients whose serums agglutinated strains of *S. pyogenes-aureus* in a high titer, and for this reason these patients were treated with stock vaccines of this organism; Group II, six patients who were treated with a diphtheroid vaccine because this type of organism was the predominating one in their sputums, and because there was

no positive evidence in favor of any other kind of treatment; Group III, contains three patients who show that conditions or diseases quite remote from bronchial asthma may play some part in the cause of bronchial asthma, or at least may produce symptoms which simulate bronchial asthma. All of the patients of Group I were relieved of asthma and all associated symptoms by stock vaccine of *S. pyogenes-aureus*. Only one patient of Group II was relieved by diphtheroid vaccines. Of Group III one case was associated with hernia, and relief from the hernia by operation was accompanied by relief from asthma. A second case was associated with pituitary disease. The history of the third case would suggest a diagnosis of bronchial asthma and the administration of epinephrin relieved the symptoms. Walker points out that it is quite possible that so-called bronchial asthma in patients who are sensitive to proteins is not true bronchial asthma; it is evident that cardiac, renal, pulmonary and pituitary disease all may cause symptoms which simulate bronchial asthma.

107. **Origin of Blood Platelets.**—On the basis of a careful examination of the blood of one case Emmel states that the structural changes undergone by many of the red blood corpuscles in anemic blood are such as to be especially conducive to the production of the conditions which have been described as demonstrating the origin of blood platelets from erythrocytes. In such cases a mass of blood platelets may become adherent to the surface of the erythrocyte, the contents of the corpuscles are displaced to one side with a consequent production of a very thin transparent area in the region of contact. These conditions, together with an occasional rupturing of the weakened membrane in this region during the preparation of the material, produce the deceptive appearance of a dehiscent erythrocyte extruding blood platelets. In normal blood, in which the erythrocytes are more stable in form and structure, the so-called evisceratting corpuscles are not so obviously in evidence.

109. **Bacteriology of House Fly.**—Certain bacteria which might be of importance in the spread of infectious disease were isolated by Scott from the bodies and intestinal tract of flies. Other bacteria, while of themselves not pathogenic under normal circumstances, but which have been universally accepted as being indicators of dangerous contamination by excreta, were frequently found. Such organisms include the colon bacillus, indicating that the insect has recently come into contact with fecal excretions. The finding of the pyogenic cocci on flies suggests the possibility that this insect may be the agent in the transmission of suppurative organisms from man to man, and may afford an explanation of the spread of gangrene in field hospitals under war conditions. The following pathogenic organisms were isolated from these flies: *Staphylococcus pyogenes-aureus, albus* and *citreus; tetragenus, B. acidi-lactici; B. coli-communis; B. coli-communior; B. suipestifer; B. coli-anaerogenes; B. proteus-vulgaris; B. cuniculicida; Strephtococcus fecalis* and *pyogenes.*

110. **Isolation of B. Cuniculicida.**—*B. cuniculicida* was recovered by Scott from two common house flies during the course of investigations. This is said to be the first reported instance of such recovery.

111. **Bacteriologic Production of Acute and Chronic Kidney Lesions.**—With a single exception all of the twenty-one animals which received the intravenous injections of living cultures of *B. mucosus-capsulatus* showed either acute or chronic kidney lesions.

112. **Phagocytosis in Vivo.**—Bartlett and Ozaki found that when the leukocytes become less capable of ingesting bacteria, the phagocytic tissue cells of the lung, spleen and the liver act to a greater or less extent in a compensatory way for the deficient part of leukocytes. This fact is of great significance for the elimination of bacteria from the circulating blood. The bacteria introduced into the blood stream are chiefly detained by the spleen and liver, if the lung is excluded, where the detention of bacteria is chiefly temporary. This peculiar biologic property of the spleen and liver is, if not completely, partly lost when these organs undergo a marked degeneration. This probably depends on the lessened vitality of the macrophages present in these organs.

114. **Myeloma with Metastasis to Liver and Spleen.**—The view that true myeloma does not form metastases has been emphasized ever since the first recognition of this condition. There is, however, a small group of cases in which the tumor described seems truly to belong to the myeloma group, and in connection with which there have been found foci of identical tumor tissue at some distance from the bony involvement. A summary of such cases found in the literature is given by Pepper and Pearce and a case is reported which they believe belongs in this group. This case is of unusual interest in that no definite nodules of myeloma were demonstrable by Roentgen rays or at necropsy, and secondly, because there was found throughout the liver and spleen, which were grossly normal, a diffuse infiltration of microscopic foci of cells identical with those of the bony tumors. These findings seem to justify a claim of true metastasis formation in this case. Most of the features of this case are in close accord with the typical findings in myeloma. The male sex, the advanced age, 52 years, the nature and distribution of the pains, and the fatal outcome after a slowly progressive course are all characteristic. So also are the anemia and the Bence-Jones proteinuria. The white corpuscles were present in a proportion of 1 to 100 red blood cells and the differential count showed 21.9 per cent. myelocytes. The bones affected were those most commonly involved.

115. **Acid-Fast Organisms in Distilled Water.**—Keilty calls attention to factors not previously reported concerning acid-fast bodies and bacteria in distilled water. He divides distilled water into sterile, sterilized, clean and dirty. Sterile distilled water is free from all bacterial bodies. Distilled water may be contaminated in the still, the tank or collecting bottle, and show different types of organisms, including acid-fasts in most instances. The acid-fasts may or may not be morphologically like the tubercle bacillus. The older the distilled water is and the larger the amount of sediment present, the greater the number of acid-fasts will be found. In perfectly clean, but nonsterile distilled water acid-fasts may appear after standing for a month. Keilty concludes that in all bacteriologic work it is advisable to use sterile distilled water collected in sterile stills, tanks and bottles.

Kansas Medical Society Journal, Topeka

September, XVII, No. 9

116 Jaundice in Newborn. M. Hahn, Arkansas City.—p. 237.
117 Fractures of Lower End of Humerus. J. F. Hassig, Kansas City.—p. 242.
118 Intoxication. J. Baird, Coffeyville.—p. 244.
119 Therapeutic and Diagnostic Value and Technic of Lumbar Puncture. J. J. Harrington, Osawatomie.—p. 246.

Medical Record, New York

September 15, XCII, No. 11

120 Digitalis in Treatment of Auricular Fibrillation; Report of Three Cases of Arrhythmia. H. C. Gordinier, Troy.—p. 441.
121 Compromising with Consumptives. J. B. Hawes, 2d, Boston.—p. 447.
122 Pathologic Physiology of Heart as Revealed by Polygraph and Electrocardiograph. L. F. Bishop, New York.—p. 450.
123 Practical Points in Use of Strophanthus. E. E. Cornwall, Brooklyn.—p. 451.
124 Some Suggestions Regarding Urethritis Patient. W. S. Reynolds, New York.—p. 453.
125 Time Element in Some Physical Processes. J. A. Hagemann, Pittsburgh.—p. 456.

New Jersey Medical Society Journal, Orange

September, XIV, No. 9

126 Observations on Thyroid. J. F. Hagerty, Newark.—p. 341.
127 Diagnosis of Ectopic Pregnancy. F. W. Langstroth, Ridgefield Park.—p. 349.
128 Parturient and Practitioner. W. B. Warner, Red Bank.—p. 352.
129 St. Michael's Hospital Jubilee. E. J. Ill, Newark.—p. 355.

New York Medical Journal

September 15, CVI, No. 11

130 Peroral Endoscopy. H. Arrowsmith, Brooklyn.—p. 485.
131 Control of Hemorrhage from Upper Digestive Tract. E. L. Kellogg, New York.—p. 487.
132 Conclusions Drawn from Comparative Study of Different Methods of Performing Wassermann Reaction. J. Bronfenbrenner, Boston, and M. J. Schlesinger, Pittsburgh.—p. 489.
133 Emotional Influences in Gastro-Intestinal Diseases. M. G. MacNevin, New York.—p. 491.

134 Use of Term "Hysteria." M. Solomon, Chicago.—p. 494.
135 Serovaccine Treatment of Pneumonia. J. Broder, New York. —p. 499.
136 Causes of Appendicitis. H. P. De Forest, New York.—p. 501.
137 Hygiene of Rural Schools. J. A. Nydegger, Baltimore.—p. 505. To be concluded.

Philippine Journal of Science, Manila

January, XII, Sec. B, No. 1

138 Experimental Acclimatization to Tropical Sun. A. O. Shaklee, Manila.—p. 1.
139 Influence of Bile on Distribution of Cholera Vibrios in Digestive System of Experimental Cholera Carriers. O. Schöbl, Manila. —p. 23.
140 Common Intestinal Parasites. F. Garcia, Cebu.—p. 25.
141 Case of Advanced Pregnancy in Broad Ligament. P. Guazon, Manila.—p. 33.

Washington Medical Annals

September, XVI, No. 5

142 Ureter Stricture; Report of One Hundred Cases. G. L. Hunner, Baltimore.—p. 281.

Wisconsin Medical Journal, Milwaukee

September, XVI, No. 4

143 Social Service, an Ally of Preventive Medicine. A. L. Murray, Milwaukee.—p. 115.
144 Tests for Estimating Functional Efficiency of Kidneys. J. F. Schneider, Oshkosh.—p. 119.
145 Outlines for County Medical Meetings. E. Evans, La Crosse.—p. 122.
146 County Society and Laboratory. J. M. Dodd, Ashland.—p. 124.
147 Would Old Age and Disability Pension for Aged and Needy Physicians Be Possible? R. W. Cairns, River Falls.—p. 126.
148 Ways and Means of Increasing Income of State Society and of Establishing Trust Funds. T. J. Redelings, Marinette.—p. 128.
149 Training in Camp Life. M. R. Wilkinson.—p. 130.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

Archives of Radiology and Electrotherapy, London

August, XXII, No. 3

1 Suppression of Inverse Current in Discharges from Secondary Terminals of Induction Coils (Including New Method of Exciting Roentgen Ray Bulb, with Special Reference to Coolidge Tube). J. A. Shorten and T. W. Barnard.—p. 65.
2 Some New Mechanotherapeutic Apparatus. J. Hall-Edwards.—p. 82.
3 Roentgenography of Duodenum, with Special Reference to Lesions Beyond First Portion. J. T. Case.—p. 87.

British Medical Journal, London

August 11, II, No. 2954

4 Institutes of Surgery: Historical Review. B. Moynihan.—p. 171.
5 Reconsideration of Principles and Methods of Hugh Owen Thomas. Some Reflection on Thomas' Splints and Practice. J. L. Thomas. —p. 175.
6 Origin of Orthopedic Surgery. A. R. Jones.—p. 180.
7 Use and Abuse of Bone Grafts. T. P. McMurray.—p. 180.
8 *Possible Electrocardiographic Sign of Myocardial Change. S. R. Wells and J. S. Goodall.—p. 182.

September 1, No. 2957

9 *Treatment of Wounded Knee Joint. H. G. Barling.—p. 277.
10 *Early Treatment of Gunshot Wounds of Knee Joint. H. M. W. Gray.—p. 278.
11 Results of Sixty Consecutive Cases of Wounds of Knee Joint. W. H. Ogilvie.—p. 280.
12 *Treatment of Gunshot Wounds of Knee Joint. C. M. Page.—p. 282.
13 Treatment of Certain Selected Cases of Septic Arthritis of Knee. W. Rankin.—p. 287.

8. **Electrocardiographic Sign of Myocardial Change.**—As the result of the examination of several thousand cardiac cases Wells and Goodall have become increasingly convinced that the height of the second ventricular or T wave affords some indication of the efficiency with which the ventricles are functioning. They report two illustrative cases with a syphilitic history. One patient complained of pain in the left side, only being able to sleep when lying on the right side, pain over the sternum, slight dyspnea, and a sensation of sickness over his heart on exertion, which was increased by exercise and after meals; there was no cough or edema. The area of cardiac dulness was slightly enlarged, the apex beat being in the fifth space near the nipple line; the first sounds were weak but no murmur was audible; the pulse rate 100, blood pressure 140; he did 10,107 foot pounds of work in two minutes, there was a poor reaction to work and he showed signs of collapse. The electrocardiogram showed an absence of second ventricular or T waves in Leads 1 and 2 with inversion in Lead 3. He was treated with mercurial inunctions and steadily improved. When examined again in 1916 his pains had disappeared, the cardiac dulness was still slightly increased, but the apex beat was well within the nipple line, the first sound at the apex was flapping and short, the second reduplicated, the aortic and pulmonary second sounds were audible, the blood pressure was 118; the electrocardiogram showed well marked second ventricular waves in Leads 1 and 2 with inversion in Lead 3.

The second patient complained of dyspnea and palpitation on exertion and a constant feeling of lassitude, and said that he fainted on excitement or any overexertion. He was markedly anemic, the pulse rate was 60, volume very small; the apex beat was diffuse and almost impalpable; the area of cardiac dulness was greatly enlarged, extending from 2 inches to the right of the midsternal line to over 5 inches to the left; Roentgen-ray examination revealed a very large heart, the shadow agreeing with the limit as defined by percussion; it was obviously soft and atonic, as it was horizontally placed and seemed to be lying on the diaphragm. The first sound at the apex was very faint and flapping in character, the second sounds were audible at base and apex, no murmurs could be heard; he was not exercised, nor was his blood pressure taken, as he fainted twice during examination. His electrocardiogram showed very poorly marked second ventricular waves in Lead 1, almost absent in Lead 2 and completely so in Lead 3. He was treated with mercurial inunctions and improved. The cardiac area was reduced in size. The electrocardiogram showed well marked T waves in Leads 1 and 2, and distinct T waves in Lead 3.

9. **Treatment of Wounded Knee Joint.**—Barling analyzes 845 cases. In a very high proportion of cases excision of the wound, removal of bone when necessary, removal of any retained foreign body, irrigation of the joint and closure by suture has been followed by a perfectly satisfactory healing without further interference. The proportion of these cases requiring further intervention is 25.5 per cent., and Barling believes that free use of the joint is likely to result in a large majority of those in whom the primary operation was successful. In the group in which complete closure was not possible or was deemed inadvisable, and in which the wound was packed, the results are not so good. This group includes the worst cases of injury to the bones entering the knee joint. Here the proportion of cases in which further operative interference was required is 38.4 per cent. Very useful joint function may result in many cases. Excision of the wound, removal of bone when required, removal of foreign body, suture of the wound, if possible, and packing as an alternative in selected cases, is the program Barling recommends. In a considerable number of instances materials such as formaldehyd solution and glycerin or ether have been injected and retained in the joint cavity. A few surgeons pack the joint with urea, and favorable results were obtained. One operator makes a separate incision at some distance from the wound of entry, thus securing that at all events he drives nothing septic into the joint.

Barling questions whether it matters much what fluid is used to wash out the joint, the main advantage is the mechanical cleaning out of septic material, fibrin and blood clot; but this should be done thoroughly through a free opening; the use of cannulas for this purpose is insufficient. Barling deprecates aspiration of the joint and irrigation or injection with an antiseptic fluid and would only resort to it if the fluid showed only a low corpuscular element, a moderate polymorphonuclear count, and a sparsity of infective organisms, conditions which will rarely be found. Mere aspiration is apt to be followed by a breaking of infection through the capsule of the joint and a spread into the surrounding tissues, a grave addition to the patient's troubles most difficult to overcome. Regarding aspiration as rarely a wise measure, Barling mentions three other courses: (1) free opening up of the joint; (2) excision of the joint, and (3) amputation.

10. **Treatment of Gunshot Wounds of Knee Joint.**—In dealing with operative cases Gray believes that if the injury has implicated the main vessels so that the foot is already cold and dead, amputation should be done just above the knee if the wound is likely to remain fairly clean, and through the knee if sepsis is present and the condyles are undamaged. In the latter class of cases reamputation is frequently necessary, and when the condyles are left it can be done so as to provide the longest possible thigh stump. If, as sometimes happens, one or other popliteal nerve is shot away so extensively that it cannot be sutured later on, and if the bones are much soiled as well as comminuted, the probability is that primary amputation is the best course. If sepsis is well established in presence of much comminution, especially if there be gas gangrene, and the patient in low condition from hemorrhage or toxic absorption, amputation must be done. If, in less severe cases, the opposing ends of the long bones are so comminuted that smooth articular surfaces are not available, it is probably best to do primary resection in the way recommended by Fullerton. If large fragments have resulted from the injury, if the patient has been received early and is in good condition, and if one is fairly sure of getting away infective material, the patient should be given a chance. As a general rule, if the patella alone has been shattered, as happens fairly frequently, the fragments should be removed.

If possible, the synovial cavity should be closed, except for a small drainage opening, by suturing the lateral edges and aponeuroses, possibly after undercutting the synovial membrane on each side, or by loosening the suprapatellar pouch as already described. If this cannot be done, a "salt pack" should be used. The same procedure should be carried out if concomitant injury to other bones is not extensive. In considering the question of amputation, these points are of great importance: the possibility of removing or neutralizing infective material successfully, the amount and kind of comminution, the concomitant injury to vessels or nerves, and the condition of the patient. When conservative measures are decided on, the following are the most important operative details: determination of the track which leads to the depth; thorough disinfection of skin and track; careful and complete excision of external wound and track, including the edges of the wound in the synovial membrane, if possible in one piece. Pockets must not be cut into. The least little bit of infected tissue left behind may prevent success; provision of ample access to foreign bodies or comminuted surfaces in the joint.

Careful removal, under direct vision whenever feasible, of all foreign material, whether free in the joint or embedded in the articular surfaces. Closure of the wound in layers, using fine catgut for the synovial membrane. Drainage tubing should not project into the joint. If the wound in the synovial membrane cannot be closed, a small "salt pack," separate from any other which may be required for the rest of the wound, should be inserted firmly "down to but not into" the joint, and should be left until it is absolutely loose. Tendinous or ligamentous structures exposed during operation should be covered by skin and subcutaneous tissue; otherwise they are very apt to slough, and this postpones closure of the wound, and therefore prolongs convalescence. If there is much effusion into or from the joint, of whatever nature, or if raw surfaces, whether of bone or soft tissue, are left in the joint, at the end of operation, a tube should always be inserted "down to but not into" the synovial cavity. The injection of ether, formaldehyd solution, glycerin, or hypertonic (5 per cent.) saline solution into closed joints, is of doubtful value. They are all irritants.

12. **Id.**—In dealing with wounds of the knee joint Page urges that the natural defensive powers of the part against infection should be borne in mind. Primary prophylactic (that is, within twenty-four hours of injury) operations should be radical, and secondary operations undertaken on account of progressing infection, should, short of amputation, be planned on conservative lines. The expectant treatment of wounds of the knee joint is only justifiable in the case of typical perforating injuries due to a rifle bullet. All wounds of the joint caused by shell fragments or distorted bullets should be considered as primarily infected. The primary prophylactic treatment should consist in the removal of any foreign bodies present and in the excision of the whole wound track at the earliest possible time after injury. The results at present are particularly bad in cases in which gross comminution of the diaphyses is present. A primary excision or erasion of the joint (within twenty-four hours) would probably improve the results in such instances by preventing the development of entomyelitis. Repeated aspiration of the joint and the intra-articular injection of any of the antiseptics in common use are calculated to prejudice the natural defense. It is safest to leave for a few days some drainage along the wound track after operation, certainly when bone injury is present. Any infection then left may become localized in the same way as occurs in the case of the peritoneum. A gauze wick makes a satisfactory form of drain. Immobilization of the joint during all critical periods is essential. An interrupted plaster-of-Paris splint affords the best means of effecting this. When general infection of the joint has taken place treatment by fixation, lateral arthrotomy and immunization gives the best chance of saving the limb. Secondary abscesses are to be expected, and should be evacuated after their complete development. Neither cross section and flexion of the joint or secondary excision of the knee are sound procedures.

Lancet, London

September 1, II, No. 4905

14 Meat Inspection, with Special Reference to Developments of Recent Years. W. J. Howarth.—p. 335.
15 *Physiologic and Antiseptic Action of Flavine. A. Fleming.—p. 341.
16 Nervous Unrest in Infant as Cause of Failure of Breast Nursing. H. C. Cameron.—p. 345.
17 Some Principles of Plastic Surgery: Incisions, Contour and Suture. —J. L. Aymard.—p. 347.
18 *Method of Applying Antiseptics to Deeper Parts of Wounds. T. H. Kellock.—p. 348.
19 Membranous Conjunctivitis Following Squint Operation. S. J. Taylor.—p. 348.
20 Clinical Manifestations of Doubtful Case. M. J. Petty.—p. 348.
21 Petroleum in Treatment of Pyorrhea Alveolaris. H. J. Corin.—p. 349.

15. **Physiologic and Antiseptic Action of Flavine.**—Fleming found that flavine has a very destructive action on leukocytes, and if the action on leukocytes and bacteria be each tested for twenty-four hours its leukocidal action is far in excess of its bactericidal action. In serum under certain conditions staphylococci will grow in 1 in 32,000 flavine, *B. coli* in 1 in 1,000, and *B. proteus* in 1 in 2,000. Flavine 1 in 8,000 appears to aid the growth of *B. proteus*. Flavine 1 in 500 is usually unable to sterilize in twenty-four hours an equal volume of pus from a wound. Flavine injected intravenously in large doses immediately disappears from the blood (which acquires no bactericidal power), and is taken up by the tissues, which become yellow but acquire no inhibitory power on the growth of bacteria. Flavine 1 in 100 injected into the pleural or peritoneal cavities loses its antiseptic power within twenty-four hours. If the antiseptic is allowed to act on staphylococci and leukocytes alike for twenty-four hours and the ratio is taken of its toxicity to both of these, phenol has a coefficient ten times better than flavine when the antiseptic acts on the microbes in serum and 250 times better when the bactericidal action is estimated in pus.

18. **Method of Applying Antiseptics to Wounds.**—The Carrel method, Kellock says, has certain disadvantages. The tubes generally used are perforated with round holes for some distance from the closed end, and if there be much resistance to the exit of fluid at the deepest part the solution finds its way through the openings nearer the surface of the wound and so the deeper parts are not reached. These tubes, too, act to a certain extent as drains. Pus finds its way into them through the openings and is washed back into the wound again when fluid is allowed to flow. Another disadvantage of the method is the necessity of keeping the patient still. Movement on his part is apt to cause the tubes to be drawn out of the wounds, and it is not at all an uncommon experience to find tubes that were originally inserted deeply into a wound lying only just under, or even on, the surface. Attempting to improve on this, Kellock has found the following method

of much service. Taking a piece of drainage tube about 8 or 10 inches in length and of caliber about equal to that of a No. 8 catheter, the end is securely closed by a ligature and a small oblique incision made with sharp scissors as near as possible to the closed end. The incision should cut a small valve with apex directed toward the closed end—the more oblique it is the better—and should at its base divide one third of the circumference of the tube. This incision will be found to act as a most efficient valve, opening under very slight pressure from within and preventing any regurgitation of pus or of the irrigated fluid. The tied end should be inserted to the very depth of the wound and the free end of the tube left projecting through the dressings; the number of tubes used must depend on the size and character of the wound, but it will generally be found that one, or at the most two, will suffice. In cases of a perforating wound of a limb or of a wound with two openings widely separated a very useful modification is to ligature the tube at its center and cut a valve on each side of the ligature and pointing toward it. This is passed through the wound and the irrigation done from both ends. In this way any fluid that is irrigated into the free ends of the tube must certainly find its way to the very bottom of the wound and from there toward the surface.

Medical Journal of Australia, Sydney

August 18, II, No. 7

22 Desert Hospital at Work. R. Macdonald.—p. 135.
23 Impressions of Country Practice. J. G. W. Hill.—p. 136.
24 Prognosis of Pulmonary Tuberculosis. A. Lewers.—p. 139.

Sei-I-Kwai Medical Journal, Tokyo

May, XXXVI, No. 5

25 Neutralizing Action of Urea on Tetanus Toxin. H. Sewaki and Y. Tagami.—p. 27.

August, No. 8

26 Id. H. Sewaki and Y. Tagami.—p. 71.
27 Accelerating and Inhibitory Actions of Various Micro-Organisms on Tubercle Bacillus. H. Sewaki and Y. Tagami.—p. 86.

Archives Médicales Belges, Paris

July, LXX, No. 7, pp. 577-672

28 *Poisoning from Asphyxiating Gases and Its Treatment. A. Colard and P. Spehl.—p. 577.
29 *Repeated Autovaccination in Treatment of Convalescent Typhoid and Paratyphoid Carriers. F. Goubau.—p. 590.
30 Total Laryngectomy for Cancer in Soldier of Twenty-Eight; Recovery. C. Sterckmans.—p. 605.
31 Present Status of the Vitamins. P. van Reeth.—p. 615.

28. **Treatment of Poisoning from Asphyxiating Gases.**—Colard and Spehl combine venesection and oxygen in treatment of the effects of poisonous drift and similar gases. The intoxication is of three types: (1) a brutal and subacute asphyxiated condition from massive intoxication, with intense cyanosis, froth on the lips and vomiting of blood, with rapidly fatal outcome; (2) an acute state of asphyxia developing in those who at first did not seem to be severely intoxicated. The generalization of the bronchitic and fine râles indicates the extent of the pulmonary lesions and explains the asphyxia. The intense cyanosis and changes in the pulse and respiration are characteristic; (3) the third type presents the clinical picture of tracheobronchitis from caustic action, characterized by inflammation of the large and small bronchi and of portions of the lungs, but with enough sound tissue left to maintain the aeration of the blood and ward off asphyxia. Men who have been gassed must be kept under close surveillance, especially during the second week on account of these pathologic changes in the mucosa. Bilancioni produced ulceration in the lungs of gassed animals, and several of the clinical cases here described in detail had a febrile period between the eighth and twelfth days. The clinical picture of the second and third types is much the same at first; then the men in the first group develop asphyxia while those of the second group continue merely their tracheobronchitis. When those of the first group get over their asphyxia, then the clinical picture of the two groups becomes similar once more. In both groups, there is liable to be a febrile period in the second week. The effectual treatment was with venesection and prolonged inhalation of oxygen. Venesection was done at once on every asphyxiated man, fully 300 c.c. of blood being drawn at the bend of the elbow, repeated the next day in the severer cases. The oscillometer shows high blood pressure, but still the blackish blood flows slowly, evidently owing to its exaggerated viscosity. A weak pulse, therefore, in serious intoxication does not contraindicate venesection. It should be done promptly and a large amount of blood withdrawn, from 300 to 500 c.c. according to the condition. The beneficial action from inhalation of oxygen was even more pronounced. The effect depends greatly on the method of administration. The lack of benefit, of which some physicians have complained, is probably due to incorrect technic. Some wait too late and give it to the moribund patient; others give the oxygen too fast, emptying the tank too soon. The proper way is to administer it continuously under a moderate pressure, keeping it up for hours or even days, the patient thus breathing constantly an oxygen atmosphere until the alarming symptoms are past. With this technic, this soon occurs. They give an illustrated description of the arrangement with which they realize these desiderata. The oxygen from the tank passes through tubing into a Wulff jar with three necks, and then through a jar with two necks, a Carrel comb tube and stopcock interposed between the jars. The middle neck of the Wulff jar is connected with a rubber bag to equalize the pressure. The oxygen is introduced through a catheter pushed through the nostril into the rhinopharynx. It is held in place with a string fastened to the brow with a strip of adhesive plaster. As the oxygen is turned on, the bubbling in the two-necked jar shows the rapidity of the flow. It may become stopped by mucus obstructing the catheter in the nose. By this arrangement, oxygen can be administered to more than one patient at a time from the same tank. The passage through the water in the two-necked jar cleans the gas, and moistens it, while the dosage can be regulated for each of the patients separately. The amount found most effectual was from 100 to 150 liters of oxygen for the first hour per individual. When the distress was relieved and the cough and respiratory spasms less violent, the inflow was reduced to about 50 liters an hour. This catheter arrangement does not annoy or incommode the patient like masks and mouthpieces, and he gets the peace and quiet he needs. In a few particularly grave cases they supplemented these measures by giving a little digitalis and strychnin. To ward off secondary infection, especially for those with pulmonary complications, they placed the men in special, well ventilated rooms in which the air was kept constantly humidified with eucalyptol spray. All the other gassed men were in vast barracks with movable sides, kept open night and day. The beds were at least 6 feet apart, and the men were kept in bed for a week at least, even in the apparently mildest cases. Instillation in the nostrils of medicated oil, and inhalation of tincture of benzoin and eucalyptus completed the array of measures to ward off further pulmonary complications, but these are all subsidiary to the main thing, the venesection and oxygen. The value of the treatment is shown in the fact that all the men recovered. The rapidly fatal cases did not live to reach this hospital, Cabour. The Carrel comb-tube referred to has four prongs, and a rubber tube can be fitted to each and thus supply four men with the oxygen at once from the one tank.

29. **Repeated Autovaccination in Treatment of Typhoid and Paratyphoid Carriers.**—Goubau tabulates the findings as to persistence of the bacilli in 431 persons of all ages and both sexes who had been vaccinated once against typhoid and 246 unvaccinated. Of this total 677, 14.33 per cent. still harbored the bacilli after apparent recovery from the typhoid or paratyphoid, but the vaccinated got rid of them sooner than the nonvaccinated, although the difference is not very striking in the table giving the details in sixty-seven cases. None of the vaccinated were carriers of typhoid bacilli beyond the seventh month, while they were found up to the sixteenth month in 0.43 per cent. of the unvaccinated. No carriers of paratyphoid A were found after the fifth month or of B after the seventh. Another group of thirty convalescent carriers were treated with autovaccine or a Wright monovalent vaccine, in weekly injections, and the bacilli disappeared completely in two months in all of the twenty-three thus treated during the first

five months after the disease. The details are tabulated in full of each of the thirty cases, and Goubau remarks that they apparently establish the efficacy of this autovaccine method of curing carriers. The bacilli disappeared from the convalescents given the vaccine treatment much earlier than in those not thus treated. The effect was prompter the shorter the period after defervescence when the autovaccine was commenced. After an interval of five months no appreciable effect was apparent in 43 per cent. of the cases. When the interval had been only two months, six carriers were cured with three injections; three with four and two others with five and six. The precautions are those for vaccine therapy in general. One case warns to be on the alert for latent tuberculosis as there is a possibility that the repeated vaccine injections may have contributed to the development of frank tuberculosis soon after.

Archives de Médecine des Enfants, Paris

August, XX, No. 8, pp. 393-448

32 *Appendicectomy on Twelve-Hours Old Infant. M. Vargas (Barcelona).—p. 393.
33 *Acute Meningitis in the Newborn. Condat.—p. 404.
34 *Meningo-Encephalitis in the Occipital Region. (Ectopie du cervelet.) E. Kirmisson and Tretiakoff.—p. 412.
35 Obliteration of Inferior Vena Cava in Boy of Twelve. J. Comby. —p. 418.
36 *Hemorrhagic Pleurisy and Sarcoma of the Mediastinum. J. Comby. —p. 423.

32. **Appendicectomy on the New-Born.**—Vargas gives an illustrated description of an infant with a gap in the abdominal wall so that some of the viscera escaped. He was able to reduce the extensive hernia and suture the wall. As the appendix presented under his hand, he resected it as is his practice in such circumstances, and clinically normal conditions were promptly restored. The malformation was of the type of periumbilical cutaneous aplasia. This is the fifth case of the kind he has encountered. The first description of it dates from 1557.

33. **Acute Meningitis in the New-Born.**—Condat relates that three cases of this kind were in the hospital in a recent month. It seems that meningitis is not so rare in the newborn as generally assumed, but it escapes recognition as a rule. Even lumbar puncture may fail to clear up the diagnosis. The symptoms are masked by the general infection of which it is a complication. The streptococcus was found in one case, the pneumococcus in the others.

34. **Meningocele in Young Infant.**—The hernia contained part of the cerebellum in the case described, but this was not suspected before the operation. The base of the tumor was cut away and the pedicle ligated. There were no convulsions or twitchings, and the child seemed to be doing well when it succumbed to an intercurrent violent gastro-enteritis the nineteenth day. The ectopic nervous tissue was evidently a kind of neoplasm, an encephaloma. It included the left lobe of the cerebellum. The right lobe was inside the skull, the cerebellum having evidently twisted sideways.

36. **Hemorrhagic Pleurisy.**—Comby reports two cases of hemorrhagic pleurisy in a girl of 16 and child nearly 3. The particulars of the cases closely resemble two recently published by G. Guidi. They teach that when a pleural effusion is found hemorrhagic, the chances are that malignant disease is already installed in the mediastinum, either in the pleura, lung or anterior mediastinum. In one of Comby's cases the sarcoma had started in the thymus. In all the four cases the onset was similar to that of serofibrinous pleurisy. But soon that half of the chest began to bulge, with exaggerated collateral circulation. Tapping gives only brief relief when the general and local symptoms become aggravated, but the hemorrhagic tint warns of sarcoma.

Paris Médical

August 25, VII, No. 34, pp. 161-176

37 *Anaphylaxis to Quinin. J. Héran and F. Saint-Girons.—p. 161.
38 *Hypnotic Suggestion for the Wounded. P. P. Podiapolsky.—p. 165.
39 Wounds of the Spleen. J. Fiolle.—p. 170.
40 Modification of Haret-Keating-Hart Method for Localization of Projectiles. A. Badolle.—p. 173.

37. **Case of Anaphylaxis to Quinin and its Cure.**—The young soldier had contracted malaria at Saloniki but was unable to take quinin as it induced vomiting, pruritus, urticaria, colic, dyspnea, distress and lower blood pressure. This tendency to anaphylaxis was overcome by giving him an hour or an hour and a half before the dose an anti-anaphylactic dose of 0.005 gm. quinin sulphate and 0.5 gm. sodium bicarbonate. After this he could take rapidly increasing doses of quinin without any manifestations of anaphylaxis. The case recalls Pagniez' patient whose intolerance for albumin in his food was overcome by his taking a dose of 0.5 gm. peptone one hour before each meal. Quinin, therefore, must now be added to the list of substances which induce anaphylaxis under certain conditions. The case teaches further that in case of drug eruptions and similar disturbances, before renouncing the use of the drug in question it might be well to try this anti-anaphylactic method of a preliminary small amount—the phylactic dose—before the real dose.

38. **Hypnosis in the Field Hospital.**—Podiapolsky writes from Saratov in Russia to call attention to the way in which he has sometimes been able to free the wounded from suffering by hypnotic suggestion that there was no pain or by throwing them into a hypnotic sleep. He describes in detail a number of peculiarly distressing cases in which the immediate relief was most welcome. In war conditions he has found that the men responded with exceptional facility to hypnosis; he found only about 2 per cent. quite refractory. In conclusion he exclaims, "Why give chloroform to subjects who at a word drop off into an artificial deep slumber, which can be counted on in about 17 per cent. of the cases." Even the first degrees of hypnosis permit operations with much less of the general anesthetic than would otherwise be necessary. He has found it useful for the wounded of all the nationalities that he has encountered, Slavs, Teutons and Italians. He does not advise the hypnosis for major operations but mainly for the sensory crises of psychic origin, such as the pain felt apparently in a limb after it has been amputated. A single hypnotic sitting may cure completely distressing pains of this nature. Podiapolsky's polyglot environment caused trouble sometimes, as he did not always know the word for "wake up" in the patient's own tongue. Now he makes sure of this before attempting the hypnosis.

Presse Médicale, Paris

August 2, XXV, No. 43, pp. 441-448

41 *Elimination of Quinin by the Urine. E. Jeanselme and Dalimier. —p. 441.
42 *Pathogenesis and Evolution of Diphtheria. J. Danysz.—p. 442.
43 *The Oculocardiac Reflex in the Wounded. J. Gautrelet.—p. 443.
44 Arthrodesis of the Foot. A. Broca.—p. 444.

August 6, No. 44, pp. 449-464

45 *Contracture of the Fingers with Traumatic Injury of the Nerves of the Arm. (Les griffes.) H. Claude and R. Dumas.—p. 449.
46 *Soldiers with Heart Disease. (Les cardiaques du front en 1917.) C. Aubertin.—p. 451.
47 *What Can be Expected from Radiotherapy for War Wounds Involving Nerves. H. Bordier and M. Gérard.—p. 453.
48 Small Epidemic of Amebiasis. A. Fuchs and H. Bouchet.—p. 455.
49 Danger of Incomplete Emergency Operations. M. Lagoutte and J. Le Grand.—p. 455.
50 Technic for Vaccine Therapy of Certain Forms of Chronic Intestinal Disease. A. Berthelot.—p. 458.

41. **Elimination of Quinin by the Urine.**—The tabulated findings show that quinin has to be administered daily to keep the patient under its continuous influence, by whatever route it is given with the exception of the intramuscular. With this route, administration every second day suffices.

42. **Diphtheria.**—Danysz presents theoretical data testifying to the fundamental difference between the evolution of diphtheria and of the majority of other infectious diseases. It seems to be a local infectious disease caused by a colloidal, soluble, directly toxic antigen with a special affinity for tissues of ectodermic origin. There is no incubation. The normal intracellular antibody can fasten the antigen and form compounds with it. The resulting intracellular reactions are immunizing if the quantities of antigen and of antibodies balance each other. They become pathogenic when the antigen is in excess. The intravascular reactions consist in neutral compounds soluble and able to be directly assimilated or eliminated if the antigen and antibodies (antitoxin)

balance each other, or if the latter are in excess. Diphtheria never induces anaphylactic hypersusceptibility.

43. **The Oculocardiac Reflex in the Wounded.**—Gautrelet emphasizes the peculiar intensity and constancy of the oculocardiac reflex in most of the wounded when the test is applied several months later. It is exceptionally intense in the men with reflex contracture. The only exceptions are the cases of exclusively bone injuries. These findings suggest that the nervous system is unbalanced, the autonomic nervous system gaining in influence.

45. **Contracture of the Fingers.**—Claude and Dumas give an illustrated description of the various types of claw-fingers that develop after the different types of injury of the nerves in the arm. They must not be regarded as inevitable or necessarily permanent, but should be warded off or overcome by massage of the muscular masses of the forearm, especially of the flexor group, the massage repeated twice a day, at least, under the directions of the neurologist and surgeon. Each finger should be mobilized separately, to the extreme extension possible, repeating this several times a day. In addition to these passive exercises, which will aid in overcoming a tendency to stiff joints, these measures are supplemented by regular immobilization of the fingers in hyperextension on a board, at night only, unless retraction is menacing, in which case the hyperextension immobilization should be kept up the greater part of the day as well as at night. When these measures are applied systematically and efficiently from the first, he says, that day will witness the disappearance of claw-fingers in all cases except with absolutely irremediable section of the nerve.

46. **Heart Disease on the Firing Line.**—Aubertin states that during the three years of the war the men with heart disease have been gradually sifted out and sent back to him as chief of a service for heart disease. Many with mild functional disturbances promptly recuperated and returned to their post at the front. Those with organic trouble have been apportioned to light duty or dismissed from the ranks altogether. In a recent series of "cardiacs" thus received at his service, 9 per cent. were sound and had merely managed to convince the army doctor that something was wrong with their heart. In 12 per cent. the heart symptoms were traceable to incipient tuberculosis, alcoholism, anemia in the young and fatigue in the older men, without actual heart disease. With actual organic trouble he found only two cases of thyroid origin among the thirty-two men with tachycardia and one case of paroxysmal tachycardia. Extrasystolic arrhythmia is generally labeled myocarditis, although his examination always failed to disclose anything abnormal in the functioning of the heart. This type of arrhythmia, he remarks, frightens the unwarned physician more than it frightens the patient. In short, he declares in conclusion, there still are some men at the front with organic heart disease, but nearly all have some slight aortic systolic murmur which escapes detection except at times of unusual physical stress, at which time attacks of tachycardia develop. The soldiers with valvular disease have nearly all been sifted out by this time.

47. **Radiotherapy for Wounds of Nerves.**—Bordier and Gérard report twenty-five cases to confirm the great benefit liable to follow exposures to the Roentgen rays after war injury of nerves. The response to electric stimulation returns to normal when the exposures are given early. They advise surgical intervention when the reaction of degeneration is complete. Then radiotherapy applied at once may promptly restore normal conditions. They are hopeful that it may be possible by this means to ward off paralysis and other infirmities consecutive to severe injury of nerves. But to accomplish this, the men with one or more nerves which fail to respond to electric stimulation must be kept in the hospital long enough for the different measures applied to realize their full and complete therapeutic effect.

Progrès Médical, Paris

August 11, XXXII, No. 32, pp. 265-272

51 *Reaction to Pinching of Muscle over Pleuropulmonary Tuberculous Lesion. (La réaction myotonique du trapèze dans la tuberculose pleuropulmonaire.) M. Loeper and H. Codet.—p. 265.

52 *Simple Contusion of the Knee. A. Chalier.—p. 266.

53 Symptoms with Lesions of the Cauda Equina. J. Lhermitte.—p. 267.

54 *Occupational Training of War Cripples. A. Marie and A. Rodiet.—p. 269.

51. **Reaction to Pinching of Muscle Over Tuberculous Pleuropulmonary Lesion.**—Loeper prefers to call this the myotonic reaction, as elicited by pinching the trapezius. Whatever the response, it is normally alike on both sides, and when it is exaggerated on one side only it points to irritation of the muscle fibers from some cause. In his experience with 300 tuberculous patients examined, the myotonic reaction was more accentuated on the side of the active pleuropulmonary lesion. Congestion of the apex was always accompanied by exaggeration of the reflex, while it was always reduced with pleurisy without effusion. Of course sclerous lesions and other torpid trouble are not accompanied by the myotonic reaction, but it may be found an aid in locating a pulmonary lesion, in estimating its depth beneath the surface, and whether it is active or not.

52. **Contusion of the Knee.**—Chalier calls attention to two mistakes constantly made by army surgeons, the undue clinical importance attributed to simple slight hydrarthrosis, and the inadequate treatment given sprain and hemarthrosis. The latter requires immediate and absolute immobilization in bed for several days, with a cotton compressing dressing. If the effusion persists or increases, by the fourth or fifth day it should be evacuated by puncture and the knee should be immobilized in plaster. One puncture is generally enough, and massage should be applied, still keeping the man in bed, with automassage, active contraction of the quadriceps, raising and lowering the leg. By the eighth or tenth day the man can be allowed to walk a little, the knee still in the plaster ring until the fifteenth day. After this the knee can be gradually used, and the man is ready to resume his active service in about six weeks from his trauma.

54. **Occupational Training of War Cripples.**—Marie and Rodiet discuss a bill that has passed the lower house and is now before the French senate. It is based on the two principles of the obligation to ensure professional reeducation of the wounded and mutilated soldiers, and that this should not encroach on their pension. By ensuring assistance to all disabled soldiers who are yet capable of steady occupation, the law thus provides for the most numerous category of the mutilated. It does not apply, however, to the severely crippled or to those incapable of sustained wage-earning occupation who will find their place in the soldiers' homes, and those unable to benefit sufficiently by training after it has been given a thorough trial. Marie and Rodiet urge that the present bill should be amplified to include special provision for the "mentally disabled," the neurasthenic, the depressed, the confused, and those disabled by derangement of the nerve centers. Most of them have a home and a family to return to. But those who have no home, what is to become of them? Some provision should be made for them instead of keeping them on indefinitely in the hospitals. Their suggestion is that the nervously and mentally disabled of this type should be boarded out in families in country districts. This method of assistance offers a more cheerful and a saner life than hospital existence in towns. It conforms better to the aspirations of the individual and to mental and physical hygiene. It also spares the public funds the enormous expense of hospital care for so many with grave chronic affections and those disabled beyond steady wage-earning capacity. This plan of boarding out in the country the chronic invalids was proposed before the war by P. Fleurot to relieve the overcrowded Paris hospitals.

This method of boarding invalids out in country families has long proved its usefulness in the other countries of Europe, and in France it has been successfully applied since 1892 for a large number of the chronic insane who are not getting any further benefit from hospital treatment. The board in charge of the war cripples, provided for in the bill, could assemble these mentally disabled in certain villages or small towns, letting them choose the family with which they wish to make their home. The board paid must not encroach on the man's pension. These disabled might be capable of

some light work, possibly home work. Bergonié has recently reported astonishingly fine results obtained in the correction of motor sequels of war wounds by graduated farm labor. The authorities in consequence are already organizing small agricultural sanatoriums in connection with the institutes for physiotherapy. By extending this system, the mentally and nervously disabled would find homes and excellent conditions for restoration to normal.

Revue Médicale de la Suisse Romande, Geneva

April, XXXVII, No. 4, pp. 173-252

55 Mycelic Concretions in Lacrymal Canals. L. G. Welt.—p. 173.
56 Benefit from Arsenobenzol in Case of Echinococcus Disease of Peritoneum and Liver. H. Curchod.—p. 186.
57 Surgery at Swiss Base Hospital. H. Vulliet.—p. 195.
58 Management of Calculus in Child's Ureter. C. G. Cumiston.—p. 212.
59 *The Iodin Urine Reaction. A. Thury.—p. 215.
60 Large Tuberculoma of the Mesentery in Child of Eight. C. M. Du Pan.—p. 222.
61 Multiple Paralysis of Cranial Nerves from "Shell Wind." D. Pachantoni.—p. 226.

August, No. 8, pp. 473-524

62 *Operations for Hernia in Children and the Remote Results. J. Brossy.—p. 473. To be continued.
63 *Indicanemia as Symptom of Insufficiency of the Kidneys. J. Tchertkoff.—p. 487.
64 *Phosphaturia as Cause of Hematuria. C. Perrier.—p. 496.
65 Favus from Spontaneous Inoculation with Achorion Quinckeanum; Two Cases. C. Du Bois.—p. 506.

59. **Iodin Urine Reaction.**—Thury reports that the findings with Petzetakis' urine iodin reaction were so contradictory in her experience that it does not seem to have any value for either diagnosis or prognosis.

62. **Operations for Hernia in Children.**—Brossy here presents the findings nine years or more after an operation for hernia on 287 children. He states that nine died soon after the operation among the 642 children treated for hernia since 1888, but death in one instance was of the thymus-death variety and in another was the result of iodoform intoxication. Children liable to thymus death should not have any operation done that can possibly be deferred. In four other cases the children succumbed to infection probably acquired in the hospital. These cases show that the sojourn in the hospital is liable to entail grave consequences, and hence an operation should not be advised lightly for children; not without absolute necessity or special quarters, with one or at most two beds in the room, and no visitors allowed. The other three deaths had probably no connection with the operation. Among the 287 with an interval of at least nine years since the operation, seventeen have died during this period, including nine that were under 2 years old at the time. Two years seems to be the lowest safe limit for these operations. The article is to be continued.

63. **Indicanemia as Symptom of Renal Insufficiency.**—Tchertkoff expatiates on the importance of indican in the blood as a sign of grave incompetency on the part of the kidneys. The technic he describes for estimation of the indicanemia reveals it only when it is within a pathologic range: to 8 or 10 c.c. of serum (obtained fasting by wet cupping or puncture of a vein), he adds an equal quantity of 20 per cent. trichloracetic acid, and filters. Then, to 10 c.c. of the filtrate he adds an equal quantity of concentrated hydrochloric acid containing 5 gm. of ferric chlorid to the liter. The whole is agitated, and then 3 c.c. of chloroform is added. After having agitated it several times in the course of fifteen minutes, he examines for the color reaction. The chloroform changes to a light or dark blue according to the proportion of indican in the serum. If there is no indican, the chloroform has no color. If there is iodin in the serum, the chloroform turns pink or a pinkish violet. This technic is reliable also for detection of iodin in the serum, but as this may interfere with the indican reaction, no iodin should be given the patient before the test. In his examination of 300 serums, indicanemia was invariably found when the azotemia reached nearly 1.5 gm. to the liter, but it sometimes disappeared before the latter—a favorable sign. It persists to the end in the fatal cases. Experimental research confirmed these clinical findings. There may be indicanemia with slight uremia, but the prognosis should be based on the persistence of the former. He thinks there is no need for quantitative estimation of the indican; the fact that it is within pathologic range is enough. The range shown by the technic described is about 2.5 mg. Any amounts above this show merely that the production of indican is large; they reveal nothing beyond the fact of renal incompetency already shown by the 2.5 mg. As the kidneys fail to allow the passage of any of the substances produced in or introduced into the organism, he remarks that "uremia" or even "urinemia" is a better term than "azotemia." Whatever we term it, the condition calls for a diet which can be oxidized without waste, little albuminoids and little salts, while the caloric demands should be reduced to the minimum. Indicanemia with chronic nephritis indicates a fatal outcome in a few months or weeks.

64. **Hematuria with Phosphaturia.**—In the four cases reported by Perrier there was slight but frequent hematuria, sometimes almost continuous, with periods of exacerbation, either spontaneous or following pain in the kidney or fatigue. The general health was not impaired and micturition was normal. The urine, however, constantly contained a mineral sediment, phosphates alone or associated with urates and uric acid. There was no tendency to hemophilia, tuberculosis, lithiasis or tumors. The patients were two young men, a woman of 26 and a man of 38. He prescribed hydrochloric acid and in the one case in which his directions were followed, the urine became limpid and there have been no further disturbances. The phosphaturia is unmistakably a factor, but probably the kidneys are exceptionally sensitive.

Correspondenz-Blatt für Schweizer Aerzte, Basel

August 18, XLVII, No. 33, pp. 1057-1088

66 *Clinical Study of Cerebellar Cysts. M. Düring.—p. 1057.
67 Experiences with Vaccination against Typhoid. F. Oeri.—p. 1067.
68 Medical Certificates and the Honorarium. (Zum Krankenschein-Wesen.) C. Bührer.—p. 1072.

66. **Cyst in the Cerebellum.**—Düring's patient was a woman of 32, with three healthy children. She had been healthy except complaining of pains in the back of the neck since childhood. During the last four or five months there had been much headache, dizziness and vomiting and a brain tumor was suspected in the left cerebellum. The woman succumbed to respiratory paralysis while being prepared for the operation at the fifth month. A cyst as large as an egg was found in the left cerebellum, with a small glioma projecting into it, relics of a larger tumor, possibly. He discusses the symptoms in this case, particularly those for which the disturbance in the adjoining pons and oblongata were responsible. These remote deficit symptoms are particularly important for differentiation of intracranial tumors. The total paralysis of the left vestibular nerve was accompanied by total left facial paralysis, but the fact that the hypoglossal escaped excluded hemiplegia from a focus in the frontal lobe or anterior segment of the internal capsule. The data of this case sustain the assumption that paresis of the extremities has a cerebellar basis. Sensory disturbances are rare with tumors in the posterior cranial fossa. Puncture of the brain seems to be the only safe means to differentiate between cysts and tumors. It has given good therapeutic results, also, in the hands of some. Palliative puncture of the ventricle may be indicated in certain cases, Düring adds, puncturing at the point where pressure is highest. He calls attention further to the very high pressure noted in the ventricle on the opposite side in his case. Internal hydrocephalus is largely occipital as there is less white substance here to interfere. The occipital lobe stands puncture well.

Gazzetta degli Ospedali e delle Cliniche, Milan

July 22, XXXVIII, No. 58, pp. 809-823

69 Multiple Factors in Trench Foot. U. Tassone.—p. 811.

July 26, No. 59, pp. 825-832

70 Splint with Elastic Traction. (Ferula a trazione elastica.) M. Zanini.—p. 825.

July 29, No. 60, pp. 833-848

71 *Induced Linear Goose Flesh as Sign of Hyperexcitability of Sympathetic System. N. Pende.—p. 834.

71. **Circumscribed Goose-Flesh or Trichographism.**—Pende calls attention to a form of dermographism which indicates hyperexcitability on the part of the sympathetic nervous system. Like the white or red line of ordinary dermographism it is induced by marking on the skin with a blunt point, a line of goose-flesh minute papules following the mark. He has coined the terms trichotony and trichographism to express this induced localized contraction of the arrectores pilorum, a circumscribed localized cutis anserina or goose-flesh.

Policlinico, Rome

August 26, XXIV, No. 35, pp. 1061-1088

72 Unusual Cases and Experiences with Syphilis. C. Verdozzi.—p. 1061. To be continued.
73 Gunshot Wounds of the Limbs. V. Calo.—p. 1067.
74 Increased Infant Mortality during the War and Means to Combat it, especially in Foundling Asylums. (Riforma dei brefotrofii.) M. Flamini.—p. 1075.

Riforma Medica, Naples

August 18, XXXIII, No. 33, pp. 809-828

75 Treatment of Complications outside the Joint with War Wounds of the Knee. G. Razzaboni.—p. 810.
76 The Declining Birth Rate. A. Botti.—p. 824.

Rivista Critica di Clinica Medica, Florence

August 18, XVIII, No. 33, pp. 325-332

77 *Residual Chronic Suprarenal Insufficiency Left After Epidemic Jaundice. G. A. Notari. Commenced in No. 31, p. 309.

77. **Chronic Suprarenal Insufficiency after Epidemic Jaundice.**—Notari describes six new cases of this type, giving the findings in detail from day to day. The pigmentation resembled that of Addison's disease and the weakness was extreme; in one case there were two periods of acute suprarenal insufficiency. The exaggerated oculocardiac reflex and the organic reactions to atropin and pilocarpin show that in these cases the sympathetic hypotony seems to be compensated for by the hypertony of the autonomic system. It seems to be evident that next to the liver and kidneys the suprarenals suffer most from the spirochete infection. The spirochetes accumulate in them in enormous numbers. In the cases described the blood pressure was not abnormally low or but very little below normal and epinephrin depressed instead of raising it or did not modify it at all, or only slightly. There was no epinephrin glycosuria. The data reviewed confirm, he says, Monti's statement that besides the direct action of the spirochetes on the suprarenals, they suffer additionally, indirectly, from the alterations observed at necropsy in such cases in the solar plexus.

Prensa Medica Argentina, Buenos Aires

July 20, IV, No. 5, pp. 53-64

78 Case of Roentgen Ray Cancer. A. H. Roffo.—p. 53.
79 Inefficacy of Ready Made Vaccines in Puerperal Septicemia and Endometritis. M. T. F. de Gaudino.—p. 57.

Semana Medica, Buenos Aires

June 21, XXIV, No. 25, pp. 727-766

80 *Retention of Bile. G. Segura.—p. 727.
81 Partial Colectomy on Still Filled Megacolon. A. Ceballos.—p. 735.
82 Memoirs of a Hygienist. E. R. Coni.—p. 737. Continuation.
83 The Specific Factors in Coagulation. A. Bergman.—p. 740.
84 Mechanism of Ileus in Parturients. E. Mazzini.—p. 747.

80. **Retention of Bile.**—Segura reports eight cases to show the difficulty of differentiation in certain cases of jaundice. They emphasize that surgical treatment is imperative when jaundice has lasted for two months at farthest. The laparotomy may reveal a benign curable process when everything seems to indicate malignant disease. The retention of bile injures the liver and is liable to induce a hemorrhagic diathesis. This proved fatal in two of the cases reported in which the operation came too late, the whole trouble being merely from an echinococcus cyst in the liver. In another case the liver opened into the bile passages, and there was transient obstruction at intervals, probably from expulsion of daughter cysts. As these were finally passed along, the obstruction was only temporary and there was no tendency to hemorrhages. Even when the laparotomy discloses malignant disease, gastro-enterostomy may permit long survival as the retention of bile otherwise is liable to prove fatal before the patient succumbs to the cachexia. One of his patients was a man of 23 with primary cancer of the biliary passages, inoperable when first seen. There was no history or trace of gallstones in this case. Necropsy in the case of a man of 58 showed cancer developed in a duodenal ulcer. The ulcer symptoms had been unmistakable for two or three months and then jaundice developed within a few days, evidently from invasion of the bile duct by the carcinoma. In another case a hard drinker developed suddenly pain in the liver, and jaundice, but in the course of six weeks of rest and careful dieting the jaundice had almost disappeared and the man of 60 had gained several pounds in weight. Catarrhal jaundice was the diagnosis, but the jaundice grew more intense by the end of three weeks, with subcutaneous extravasations of blood and ascites. Necropsy revealed a primary nodular cancer in the liver. In a case of Hanot's cirrhosis of the liver there was no jaundice or fever for a year and a half, but then jaundice gradually developed with intense pruritus and a loss of over 40 pounds in weight. The stools were absolutely clay colored, and a passage for the bile was made by joining the gallbladder and duodenum. The patient succumbed to pneumonia not long after. Another man of 33, with drinking habits had long had frequent digestive disturbances, ascribed to the stomach, when a very severe attack of indigestion followed eating five melons. The bowels did not move, even under repeated doses of castor oil, and the fifteenth day jaundice developed. The liver could be palpated at the fifth rib but it was not tender through the interspaces; the lower margin was slightly tender. He improved in the hospital, gaining over 11 pounds in weight in two months and returned to work, but the liver increased in size and ascites required tapping. The diagnosis wavered between four different liver diseases after the assumption of catarrhal jaundice had been dropped, but necropsy, eighteen months after the first sign of jaundice, disclosed cancer of the ampulla of Vater.

Siglo Medico, Madrid

July 28, LXIV, No. 3320, pp. 545-564

85 Symptomatic Value of the Drawings of the Insane. R. P. Valdes.—p. 546. To be continued.
86 Primary Acute Congestion of the Lung. B. Gil y Ortega.—p. 549.

Russkiy Vrach, Petrograd

XVI, No. 14, pp. 313-336

87 *Operative Treatment of Tumors in the Bladder. S. P. Fedoroff.—p. 313.
88 Changes Proposed in the Curriculum of the Medical Schools of Russia. N. I. Ratchinsky.—p. 319.
89 Ulcer in the Bladder Induced by Colon Bacilli. G. I. Baradulin.—p. 323.
90 Agglutination after Vaccination against Typhoid. V. V. Pezharskaya.—p. 324. Conclusion.
91 Comparative Typhoid Morbidity in the Vaccinated and the Non-vaccinated. P. N. Triudin.—p. 329.

87. **Tumors in the Bladder.**—The title of Fedoroff's article is "My Views on the Modern Treatment of Tumors in the Bladder," as he is convinced that when there is a suspicion of malignant disease or the tumors are multiple or are located in what he calls the neck of the bladder, the usual treatment does not guarantee against recurrence. His experience with 165 operative cases of bladder tumor and review of the literature have shown that a single tumor can be removed by an intravesical intervention without fear of recurrence. But recurrence is the rule after an intravesical operation for multiple tumors or cancer. He knows of only one case on record (Pawlik) of survival for fourteen years without recurrence. In his own series, 20 per cent. of the 165 patients have had no recurrence during the two and a half to thirteen years since operative treatment, and nothing is known of the ultimate outcome of 50 per cent. The remaining 30 per cent. had recurrence of the tumor within two years except in two cases in which the interval was three years and one in which it was five. Fedoroff presents further arguments to prove the necessity for extending the indications for removing the bladder and transplanting the ureters at an early stage of malignant disease and with multiple tumors. The otherwise

doomed patients are thus restored to comparative clinical health and their sufferings are terminated at one stroke. He reports a few cases in detail to show the value of this dual intervention. One physician of 39 had had occasional hematuria since the age of 17, and three suprapubic operations and one intravesical had been done to clear the bladder of recurring multiple papillomas in turn by Guyon, Nitze, Casper and Bazy. Pains and tenesmus were finally almost continuous, requiring up to 0.4 gm. morphin daily, and a suprapubic fistula into the bladder complicated matters. Then, in March, 1911, Fedoroff transplanted both ureters into the lower sigmoid flexure, and, in April, shelled out the bladder with part of the prostate. The relief from pain after the transplanting of the ureters was like magic. In June the physician was able to resume his practice as if raised from the dead. When the bladder was removed the microscope showed traces of cancer in the tumor but it had not invaded the walls of the bladder or lymphatics. The bladder seems to be peculiar in this respect. But still, two and a half years later, other papillomas and a cyst developed in the small pelvis. Evidently the pelvis had been inoculated with tumor cells during the removal of the fistulous bladder. Another serious feature of the case is that the otherwise fairly healthy man has had several attacks of pyelitis during the last five years although he has been able to keep up his practice and has felt well otherwise. Fedoroff remarks that we must not forget that the kidneys in such cases must be already suffering from obstruction of the outlets by pressure from the tumors.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

July 7, II, No. 1, pp. 1-128

92 *History of a Hospital through Six Centuries. D. Schoute.—p. 3.

July 14, No. 2, pp. 129-204

93 *Chronic Headache from Loss of Muscular Balance between the Eyes. J. P. van der Brugh.—p. 132.
94 Unusual Type of Favus Traced to Achorion Crateriforme. W. L. L. Carol.—p. 140.
95 White or Whole Grain Bread. G. A. Prins.—p. 149.
96 *Suspension of Pulse and Respiration at Onset of Epileptic Seizures in Man with Complete Heart Block. W. Kouwenaar.—p. 151.
97 Participation of the Spinal Cord in Coordination of the Movements of Running. G. Van Rijnberk.—p. 156.

92. **History of Modern Hospital in Holland, Founded in 1308.**—Schoute has compiled from the archives of the hospital at Middelburg and from other local sources a valuable contribution to the history of medicine in the fourteenth century and during the centuries since. A number of illustrations show the ancient building and its administrators. The actual founder is not known, but a deed showing a bequest to the hospital from a widow is on record, dated 1308. The hospital archives were kept with minute record of details, and the financial ups and downs of the hospital reflect the political events of the various centuries. The directions for greater economy in administration at various periods are interesting. During the first centuries of its existence the archives show that the hospital combined the functions of an asylum for the aged, for foundlings and orphans, an inn for transients, charity work in general, and church, school and political headquarters, in addition to its regular hospital work. The very name for hospital in the Netherlands language, *Gasthuis*, "guest house," suggests its original manifold uses. The earliest picture of St. Barbara's dates from 1696. It required a very active and energetic campaign by two local physicians, preaching the necessity for ventilation, pure water, etc., to bring about the destruction of the antiquated building. Their pamphlet published in 1857 preaching modern hygiene told, among other records, of their own school days in the old building, the dark rooms, the ink freezing. Their campaign was reenforced by a smallpox epidemic spreading from the hospital, and the old building was demolished in 1866, but its records were preserved and the *Leggerbocks* dating from 1604 and 1687, with the rules and regulations for the administration of the hospital.

93. **Chronic Headache as a Manifestation of Asthenopia.**—Van der Brugh remarks that so many factors are liable to bring on headache, that no one physician is able to master all the specialist methods of investigation of its etiology. He devotes this communication to the habitual headache resulting from disturbance in the motor apparatus of the eyes, especially a loss of balance between the external eye muscles. He has had seventy-one cases of the kind in less than three years, and has completely cured fifty-eight with prisms. The general practitioner, the laryngologist, rhinologist and otologist, who are the ones generally consulted on account of chronic headache, can differentiate it as a case of heterophoria by bandaging one of the patient's eyes and letting him go around otherwise as usual. If the headache improves in the course of a few days under the use of the bandage, then some loss of balance is the cause of it, in all probability, and this can be readily corrected with prisms. There is a special group of sufferers in this class, he says, those who come home from the theater, lecture, concert or church with a raging headache. He has found esophoria in all such cases and with the aid of correcting prisms the tendency to headache disappeared. He describes the other types of heterophoria, and warns that girls and young women do not like to wear glasses, but when they discard their prisms the headache returns. Still more convincing is the experience that those with hypermetropia, besides the esophoria, still have their headache persist when glasses to correct the former, but not the latter, are fitted. Not until they are supplied with prisms do they lose their headaches. A special characteristic of headache from esophoria and hyperphoria is that the tendency to headache subsides in the dark and at night. Such patients usually relate that they have had the headaches a long time and have been treated for them by the family physician for weeks, months or years, without relief. They have been repeatedly examined by nerve and nose specialists but no cause for the headache could be found. They finally gave up hope and resigned themselves to their suffering, so that the prompt and complete cure when fitted with proper glasses is an overwhelming surprise. The loss of balance to which he refers used to be called latent strabismus, but time has shown that this term is incorrect. He describes a typical case in a boy of 7, showing the cure of the headache after he had been fitted with prisms, its return when he broke his glasses, and its banishing anew with the repaired glasses, while the general health improved remarkably when relieved from the depressing headaches.

96. **Heart Block with Epilepsy.**—The elderly man in question had had complete heart block for the last five years. From his thirtieth year he had attacks resembling epileptic seizures. They began with suspension of heart action and respiration. In the attacks while under observation, the pulse stopped abruptly for 105 seconds and possibly longer, while the respiration was suspended for two and three-quarters minutes. Kouwenaar discusses whether this combination of epileptic seizures and heart block is casual or there is some causal relation between them. The convulsions were bilateral, symmetrical tonic-clonic cramps with episthotonus. They bore a suggestion of Hughlings Jackson's "cerebellar attitude." This is instructive, in connection with the bulbar theory of the causes of convulsions in persons with heart block as *claudicatio intermittens* of the bulbar vessels.

Ugeskrift for Laeger, Copenhagen

April 5, LXXIX, No. 14, pp. 515-558

98 *Roentgen Treatment of Cancer. S. Nordentoft.—p. 515.
99 Case of Cerebral Syphilis. C. Gram.—p. 522.
100 Case of Keratomalacia in an Adult. Saunte.—p. 525.
101 *Foods and Dietaries. (Ernæringsspørgsmaalet.) M. Hindhede. p. 528.

98. **Roentgen Treatment of Cancer.**—In this article Nordentoft describes his experiences with roentgenotherapy of mammary cancer in particular, with the ultimate outcome. The fact that the neoplasm subsides under the influence of the Roentgen rays testifies to its malignant nature as other growths do not seem to be influenced by them.

101. **Foods and Dietaries.**—Hindhede's study of the basal protein requirement in health was summarized from the other instalments (THE JOURNAL, June 16, 1917, p. 1880). This belated number completes his article, giving the tabulated details of some of the extensive diet experiments mentioned in the abstract.